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A Century of Oregon Covered Bridges

Lee H. Nelson

It is not the purpose of this essay to merely catalog Oregon's covered bridges, past or present, but rather to suggest certain social and economic problems that caused the covered bridge to be introduced, developed, and finally snuffed out as a valid solution for spanning the stream-crossed valleys of Oregon. These are presented together with some mention of the little-known bridge builders, their techniques, weaknesses and of course their triumphs.

Nor is this a basic history of covered bridges as such, for that subject has been treated at length by others. Instead, the author has limited the field to Oregon covered bridge building, unique for its adaptation of native materials, the great number built, the remarkably short life spans, and a continuing of the tradition well into the twentieth century.

The introduction and development of covered bridge building in Oregon is another manifestation of the settler using nature to conquer his environment, for the benefit of himself and his neighbors, and thus fulfilling a basic service to frontier society. That the frontiersman could cope with such a technical problem as bridge building is a tribute to his practicality and resourcefulness. It is not evidence to support the romantic pioneer concept of innovation and genius, but rather an indication of previous building techniques applied to new and more primitive conditions.

Until the Willamette Valley settlement reached political and economic maturity, until social patterns of movement and communication began to stabilize, bridge building suffered from the pioneer habit of wasteful expediency, so that longevity, for example, was not the important factor it was in the East.

Because the western settlement patterns changed so quickly, Oregon covered bridges never reached the sophisticated level of their eastern counterparts. Subtle architectural refinements simply did not exist and even the pioneer's structural approach to the problem was a sort of crude empiricism.

To his credit, however, the pioneer produced serviceable structures to satisfy the immediate need. He often demonstrated a remarkable understanding of nature in the selection of a site for bridge building. Thus he used nature rather than forcing her as we often do today. The settler's adaptation of local materials was his most significant contribution in the field of bridge building. Lacking any previous contact with the native Douglas fir, his structural understanding of the material was necessarily limited. In the damp climate of western Oregon, the builders realized, though somewhat tardily, the value of covering their bridges, an especially tardy lesson since such had been the custom for decades in the East. But once established, the builders were loath to abandon the practical "covering" habit, so that bridges in the dry eastern half of the state were also covered.

It is the barn-like covering of course, that removes the covered bridge from the realm of the structural academics and puts it into the realm of folk architecture. The "romantic picturesqueness" portrayed in the Sunday supplements is a modern reaction, not a consciously attempted feature. But to modern eyes there is something undeniably attractive about covered bridges. The apparent affinity of a covered bridge with its site, its naive functionalism, and its symbolic representation of a by-gone day all contribute to the pleasant quality that is characteristic of the covered bridge.

On some Oregon bridges the critical joints are cleverly protected, and visual penetration of structural efficiency is thus made possible. Such efforts reduce the barn-like quality and increase the three-dimensional architectural interest. But most bridge carpenters, being neither engineers nor architects, contributed little in the way of structural or architectural innovations; instead they doggedly directed whatever artistic instincts they possessed toward making the portal distinctive. For the most part they succeeded only in constructing an inarticulate floating box.

In Oregon especially, imagination in covered bridge construction was replaced by utility. In spite of this, the natural Oregon background provides a setting for these airborne barns that makes them appear indigenous rather than contrived. More often than not the site makes the difference. Indeed, with bridge timbers virtually 'growing' on the site, the Oregon covered bridge truly is of a piece with the landscape. The Douglas fir of Oregon, so easily obtained, so strong, and of such magnificent dimensions, was the perfect answer to the bridge builder's problems. One-piece truss chords were common and economical, felled near the site and hewn on the spot.

With an abundant supply of bridge timbers readily available, the future development of Oregon covered bridges would seem assured. Today, however, man's environment is conquered with technology. Only by virtue of the economics involved, it appears we must become accustomed to seeing concrete or steel, poured or bolted to the landscape. Modern technology versus the pioneer ideal of quality, is no contest nor should it be, except that solutions in either case should be judged individually. Comparison is inevitable, however, and the covered bridge enjoys an advantage which has nothing to do with structural efficiency or the principle of least effort.

Even the twentieth century Oregon covered bridges appear anachronistic. Past generations accepted them as a familiar part of the landscape, but they are now a curious carryover from the horse and buggy era, their most salient features obscured in a fog of nostalgia. Most of Oregon's covered spans were built and destroyed within the past hundred years, and their fate has been underlined by the economic fact that what was once a supremely practical solution to bridge building in Oregon has now become unfeasible in the nation's greatest timber state.

"A GOOD SUBSTANTIAL BRIDGE"

A frontiersman confronted by an unbridged stream solved his problem in the most straightforward manner by fording. If the ford lay astride a well-traveled route, some enterprising person usually substituted a ferry. The establishment of a permanent settlement on the site or in the vicinity tended to create economic and social patterns of movement that led to bridge building. The Willamette and other western interior valleys of Oregon, bisected and intersected by streams, and blessed with a climate that earned inhabitants the name Webfeet, were natural places for bridge construction.

During the 1830s, the Hudson's Bay post of Fort Vancouver built what may have been the first bridge in the Oregon Country, across the outlet of a pond within the general confines of the post. The outlet was consequently referred to as Bridge River. A few bridges, built of logs, were built in the Oregon Country before the great migrations of the 1840s, but only a scanty reference to them has survived in available accounts.

Already during the time of Oregon's Provisional Government, the matter of bridges was pressing enough to command the attention of the legislature. The act of December 19, 1845, was the first of a procession of legal aids to private bridge construction. This act incorporated the Clackamas Bridge Company, which completed a span later known as the "old Fendal C. Cason Bridge." There was no reference in the act to covering the bridge. In fact, the wording seems to preclude such construction: "That said company shall construct a good, substantial bridge across the Clackamas river, not less than twelve feet wide, with sufficient piers, rails and other fixtures necessary to render the passage safe on said bridge, and keep the same in good repair." The act also established minimum toll rates, interesting as an index to frontier values:[1]

For every wagon and a single yoke of oxen or span of horses, mules &c	25	cents
" a single horse and carriage	18	"
" " footman	5	"
" a man and horse	10	"
" all other horses and cattle, per head	3	"

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[1] *Laws of a General and Local Nature Passed by the Legislative Committee and Legislative Assembly . . . 1843 . . . 1849* (Salem, 1853), 30-31.

Armed with the provisions of such an act a group of persons could, in theory, build a bridge, recover their investment, and profit from their enterprise.

The possibility that Oregon's commercial and social intercourse would be taxed by a system of private toll bridges was lessened by the provisions of an act of September 26, 1849. This general law provided for the building of bridges under the aegis of county governments. Each probate court was empowered to determine what bridges could be built and maintained at the expense of the county. Since this bill was the foundation for all later legislation on the subject, it is worth attention.

If twenty or more resident "householders" presented a petition for a bridge, the county was obliged to consider whether in its opinion the bridge would promote the public weal. If it were so determined, the county could appoint a bridge commissioner for the construction of the bridge in question. The act also attempted to deal with the matter of bridges connecting two counties.

To protect the public from palpable fraud, the law prohibited a commissioner from undertaking the construction of any bridge in which he had a legal interest. Realistically, the legislature provided that the bridge commissioner was empowered to "take, or cause to be taken from the adjoining or most convenient lands, such quantity of rock and timber as may be necessary for the building or repairing of such bridge." Compensation to the landowners was assured.

The journals of the county commissioners in the early 1850s indicate a wide variety in the application of the enabling act of 1849. Marion County seemed content to license ferries, while Douglas County built many bridges, especially on the road between Scottsburg and Winchester. The contrast probably stems from the difference in the size and character of the streams to be crossed.

Bridge legislation in the territorial period also included establishment of penalties for anyone who might "willfully, and maliciously, cut down or destroy any private, public or toll bridge." In 1851 the legal width of all bridges on territorial roads was fixed at no less than sixteen feet.[2] No legislation of this period specifically refers to covered bridges.

A number of bridges were built during the 1840s and 50s. In the mid-1840s, for example, a bridge was constructed on Main Street of Oregon City, near the tannery. In 1847 the gap between the Island Mills and that city was bridged, creating a "safe communication between our city and that hitherto remote spot."[3] Card & McMillan were the contractors, but nothing is known of the bridge. Though not built until 1847, its construction had been authorized by the act of December 24, 1844. Its usefulness, for reasons unknown, was limited to four years.

Its successor provides the earliest published reference to a *covered* bridge in Oregon, a report in the *Oregon Spectator*. Plans for the new span were announced on October 14, 1851, as follows: ". . . and for the old bridge to the Island Mills, a new one is in course of construction." That it was to be covered was confirmed on November 4: "The bridge leading to the Island mills is being roofed over. This will render it a durable structure."

The second known covered bridge was also built at Oregon City and its completion was hailed by the *Oregon Statesman* on June 1, 1852, with the announcement that "The Oregon Milling Company have just completed a noble bridge across the chasm adjacent to their mills. It is covered and neatly painted, and would reflect credit upon any of the old States of the Union."

However durable or noble, these bridges were carried off by the "Great Freshet" of January, 1853, the same waters that swept away Dr. John McLoughlin's sawmill.

In the early 1850s the territorial legislature authorized incorporation of several toll bridge companies. The enabling acts regulated tolls, required an accounting of expenses and income, and provided for amortization. Among the corporations thus formed were the Yamhill Bridge Company, and the Umpqua, Rogue Rivers, and Klamath Bridge companies.

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[2] *Statutes of a General Nature Passed by the Legislative Assembly of the Territory of Oregon: At the Second Session, Begun . . . December 2, 1850* (Oregon City, 1851), 91, 254, 63-65.

[3] *Oregon Spectator* (Oregon City), September 16, 1847, 3.

One of these incorporations, the Yamhill Bridge Company, brought to completion a bridge of no mean proportions. An August, 1851 stockholders' meeting was recorded by Matthew P. Deady, secretary of the company, but best known as a pioneer jurist. Secretary Deady encouraged adoption of a by-law which would prohibit the directors of the Yamhill Bridge Company from being contracturally involved in the construction. Deady hoped such a plan would give stockholders confidence in the project.

Apparently it did, for in September, an $8,000 contract was let to Messrs. Webber & Wren, Portland, for construction of the Yamhill Toll Bridge to be located at Lafayette. The plans called for a double track bridge, each track to be ten feet wide. Such a plan was similar to many eastern spans, but never found many advocates for its use in the Far West.

The abutments were of hewn timbers, bolted in place and filled with earth. Work progressed slowly so that by November only the north abutment was finished, but by its dimensions the "huge pile" was quite an accomplishment for the times. It was forty-seven feet above low water, twenty-four feet broad across the front and thirty-five feet across the rear.

By New Year's, 1852, the south abutment was also finished, and the stringers thrown across the falsework, but a January freshet carried off the south pier, leaving the contractors with an unfortunate loss. Not until fall 1852 was the bridge finished, and "beyond the reach of floods," hoped the *Statesman* editor on October 9.

This bridge is important in the annals of early Oregon bridge building as a really substantial enterprise, differing from most of the local trestle bridges in that it was a "self-supporting span," that is, a truss. The cost was unusually high for such an early bridge, and a decade was to pass before a comparable span was built.

Contractors Webber and Wren, though primarily engaged in Portland building construction, appear to have built this first bridge in Oregon which equaled its eastern counterparts. Whether it was covered is conjectural, though not important since honors for Oregon's first known covered bridge go to the Island Mills span at Oregon City, built in 1851.

By the mid 1850s, private toll bridges had become more numerous but were poorly maintained and attended. By virtue of their high tolls and restricted use, the early toll bridges often failed, as did the toll ferries, to serve the rural population adequately.

In a second attempt to stimulate and regulate bridge building with county control, the territorial legislature passed an act in 1854 which conferred power on county commissioners to incorporate bridge building companies in their respective counties. With respect to the toll bridge problems, the act provided for some

> . . . competent person to give constant and diligent attention at said bridge, from daylight in the morning till nine o'clock in the evening of each day, and also that at any hour of the night, if required, such person shall give passage to all persons requiring the same upon payment of double rates of toll allowed to be taken in the day time.[4]

The 1856 experience of W. L. Adams, editor of the *Oregon Argus*, provides some insight into the attitude of Oregon residents toward tolls. "In crossing a toll bridge on Pudding River this week, kept by Mr. Oakley, we were allowed to pass 'free.' Mr. Oakley said he never charged editors, but, like the barber that shaved Greeley, he intended to 'make it up off gentlemen.'"[5]

Some toll bridge owners were not so fortunate in their public relations. An 1857 incident is a case in point. Mr. George Irwin, owner of the Pudding River toll bridge in Clackamas County, was allegedly a quarrelsome man and not inclined to be lenient with his non-paying customers. Furthermore, he kept a rifle at the bridge to enforce the letter of his toll regulations. In an over-zealous fit of responsibility, he fired upon a Mr. Martindale, missing him. Martindale, also armed, returned the fire, killing the toll taker, an act of 'self-defense' which did much to advance the merits of 'free' bridges versus the toll bridge.[6]

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[4] *The Statutes of Oregon, Enacted, and Continued in Force by the Legislative Assembly, at the Fifth and Sixth Regular Sessions Thereof* (Oregon, 1855), 503.

[5] *Oregon Statesman* (Salem), April 1, 1856, 2, quoting *Oregon Argus*.

[6] *Oregon Statesman*, July 21, 1857, 2. Hereafter cited as *Statesman*.

When a new span was completed across a creek near the north end of Salem in 1857, the *Statesman* on January 6 headlined the event, "THE BEST BRIDGE IN THE TERRITORY, WE EXPECT." The reason given? "It is a free bridge."

"THE SAFETY AND CONVENIENCE OF THE TRAVELLING PUBLIC"

In the 1860s and 70s, after a combination of factors placed the state and local governments in the bridge-building business, covered bridges became increasingly common, although far outnumbered by toll ferries. In Marion County one of the first located references to a covered bridge concerns that constructed by the City of Salem in 1862 at the "south end of Commercial street" over South Mill Creek. Plans and specifications were filed with the city recorder, who advertised for bids to be opened February 4, 1862.

Several contractors furnished bids, varying from $5,500 to $7,500. The contract was awarded to John Snyder who failed to furnish sufficient bond, and new bids had to be obtained. On April 12, 1862, bids were opened, and a contract signed by Messrs. Clark and Hayden, who quickly proceeded with construction. At the end of September the editor of the Salem *Statesman* found room between war dispatches to announce that the bridge was completed, ". . . and, though the builders do not feel ashamed of their work, they are busily engaged in covering it," a pleasantry which no doubt, like the bridge itself, had eastern antecedents.[7]

The Salem bridge, like many others built in 1862, replaced one lost in the 1861 flood. Ten months after this disastrous flood the state legislature approved an act "to provide for building bridges." The urgency of the situation was reflected in the wording of the bill, which pointed out that "there are now a number of bridges in the state requiring immediate attention, to secure the safety and convenience of the travelling public."[8] This law brought up-to-date the requirements for bridge contracting, and repealed earlier legislation on the subject.

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[7] *Statesman*, September 29, 1862, 3. See also February 10, 1862 (advertisement); March 31, 1862 (advertisement); April 7, 1862, 2.

[8] M. P. Deady, comp., *The Organic and Other General Laws of Oregon, 1845-1864* (Portland, 1866), 877, fn. 1.

The legislature's provision for the "safety and convenience of the travelling public" represented a trend in the thought of Oregon's pioneers. No longer were they satisfied with ferry service, a system subject to the whims of floods, fluctuating toll charges, graft, rivalry, and the mood of the ferryman himself. In essence the Oregonians were paying ferry operators the price of a bridge and not getting one. Ferry franchises were often granted as payment for political debts, and ferry operators virtually controlled traffic.

The monopoly of the ferry system had an adverse effect on local economy. Few farmers could, or would afford the tolls, and many avoided ferrying by the dangerous method of fording. Some lost their lives in the process.

The situation in Eugene at the head of the Willamette Valley was especially acute. Two or sometimes three ferry tolls were exacted on routes to town from east and north. Farm cash went into river crossing. As one source described the situation, "The people of Mohawk cannot get to this place and back with a wagon short of two dollars."[9]

The result was that farmers took a dry-land route to another town, Harrisburg, rather than ferry to Eugene. This was intolerable to Eugene merchants, and they petitioned county court for another competitive ferry, but the petition was denied. The only solution was bridge building. As the editor of the paper stated the case,

> Bridges for the accommodation of the people of Lane County have long been needed, and we trust that . . . farmers can come from their homes to town without being detained by high water or waiting for the ferryman to pull his boat across a stream by hand.[10]

Urged by the increasing pressure of public desire and economic well-being, bridges became a necessity. When built, they accelerated a change in the social, economic and religious habits of rural Oregon. It became easy and habitual for the farmer to come to town frequently. Churches moved out of rural homes and schools into town, where established congregations built edifices. In the words of the editor of the *Oregon State Journal*, May 8, 1875, "The heavy loads that have so long encumbered the wheels of progress are fast becoming less. . . . It is now conclusive that we are to have a bridge at this place."

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[9] *Oregon State Journal* (Eugene), February 1, 1873, 3.

[10] *Oregon State Journal*, January 17, 1874, 3.

MURDER TRIALS AND BUILDING BRIDGES

Of the new public bridges, many were of the covered variety, if not at first building, eventually. A letter published in the Salem *Statesman* on November 13, 1865, complained: "The county is full of old, rotten bridges. I know of three or four between Monmouth and your city that are unsafe." Although the value of a roof to render the bridges long-lived was apparent, the extra cost was a burden to the county treasury. An 1865 county notice to bridge carpenters provided for an alternate bid to be exercised by the county: "All bidders are requested to put in a bid for the bridge, with and without a roof."[11] Of the three bridges built by Polk in 1869, only one was covered, at an extra cost to the county of $600.

By the 1870s the idea of covering a bridge was generally accepted, though sometimes a county court tried to save the added cost. Irate taxpayers frequently had to file petitions to have a bridge roofed, apparently in an effort to protect their investment. However, most of the substantial bridges were covered at the time of construction. Examples of post-construction covering appear in county commissioners records. In 1873 a Clackamas court-appointed superintendent reported that the covering and enclosing of the Tualatin River bridge (location not noted) was done in a "workmanlike manner," at the additional cost of $400. In 1874 the same county paid L. S. Shipley $220 to cover the bridge over Sucker Creek near Oswego. In 1880 Union County in eastern Oregon let a contract to L. R. Holmes to cover and paint the Mitchell bridge, which had just been built by the firm of A. S. Miller & Sons.[12]

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[11] *Statesman*, September 18, 1865, 2.

[12] *Oregon City Enterprise*, August 15, 1873, 3; October 16, 1874, 3. Union County Commissioners Journals, Vol. 2:411-12, January 15, 1880; 2:509, August 4, 1880 (Mss., Union County Courthouse).

There were, of course, those who felt that covering a bridge was a needless expense. "Citizen," a letter writer in the Corvallis *Gazette* of February 23, 1883, aired contrary views. He claimed to see no reason why Benton County should change from a "cheap, strong, open bridge" to a covered bridge, even though "our Commissioners claim that any of these open bridges will rot out in about ten years." He referred to the open bridges of his native Illinois, and concluded that "for Benton County to use the low, open bridge . . . would benefit her taxpayers financially."

The fact is that Benton County commissioners recognized the tendency of open bridges to rot more quickly than covered spans. Modern experience in long-term maintenance and cost analysis clearly indicates the value of protection. Decisions in 1880, however, were based on more empirical evidence. The best argument against the extra cost of covering bridges was their high mortality due to freshets and floods, acts of God which commuted the life expectancy of a covered bridge from about forty years to ten or fifteen.

Annual reports of counties suggest the extent to which bridge building dominated county budgets from the mid-1870s through the 1890s. In Lane County, for example, the bridge allowance in 1872 was $119.64, seventeenth in a list of twenty-five items. By the next year it was $524.10, tenth in rank. In 1875 it had risen to first rank, in the amount of $9,592.95.[13] On May 12, 1877, the Portland *Oregonian* noted under "Eugene Items," that "The expenses of this county [Lane] for the year ending June 30, 1877, will amount to $27,000, as against $12,000 for last year. Murder trials and building bridges being the cause of the increase."

Bridge allowances in Lane County were first in rank for at least four years to 1891, and rarely dropped below fourth position. In 1891 the amount was $62,553.54, more than half the county budget. In 1873-74, Clackamas County spent $8,000 of a $23,000 budget for bridges. As the Oregon City *Enterprise* explained, "The county is cut up by numerous streams which necessitates an extraordinary expense for bridging, and our taxes in the main have gone for this purpose."[14]

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[13] *Oregon State Journal*, July 13, 1872, 3; July 19, 1873, 3; July 17, 1875, 2.

County commissioners were not allowed to forget that bridges built with tax money represented a sizeable investment to the taxpayers, and ought to be properly maintained.

During the winter of 1876, driftwood accumulated against the Springfield bridge piers, and threatened destruction of the entire covered bridge. The *Oregon State Journal* had commented on the danger, without result. Finally on January 13, 1877, that paper aimed its editorial pen directly at the county officials, and proclaimed in righteous indignation,

> Is it not high time our County Commissioners were removing the drift from around the Springfield bridge pier? Twelve thousand dollars worth of the people's property should be better protected than that has been during the last eight or nine months. We trust they will attend to it at their next session, if not, let the people.

"THEY UNDERSTAND THE BUSINESS THOROUGHLY"

The increased interest displayed by private persons, by city and county governments, and by the state itself in the matter of bridges, attracted many carpenters to the business of bridge building. By the early 1860s, such specialists began to operate on a wider front.

In 1861, H. McDonald, "architect and bridge builder," advertised in the July 1 Salem *Statesman* that he would "attend to drafting Bridges, Private Residences, and other buildings, on reasonable terms." His services were sought not only in Marion County, but also in Polk County where he designed a bridge over the South Fork of the Yamhill River.

Other bridge 'architects' and builders soon began to advertise their talents, but the professionals did not really enter the picture until the early 1870s. The most active and prominent of the Oregon bridge builders from 1873 to 1885 was the firm of A. S. Miller and Sons.[15]

Albert Stuart Miller came to Oregon from Ohio by way of California. While in Ohio, he probably became acquainted with the Smith Patent Bridge Truss, invented by Robert W. Smith of Tippecanoe, Ohio, in 1867.

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[14] *Oregon City Enterprise*, February 28, 1878, 2.

[15] The writer is especially indebted to Kenneth C. Miller and Annie Laura Miller, both of Portland, for valuable information pertaining to

Smith's agents had attempted to promote the truss in Oregon as early as 1870, only three years and two thousand miles from the time and place of its conception, an indication not only of the competition from every quarter, but of the profits to be had in the upsurge of Oregon bridge building.

A. S. Miller purchased a contractor's franchise for exclusive rights to use the Smith truss in either Oregon or the Washington Territory. Miller's daring and Smith patent trussed bridges became the pride of Willamette Valley taxpayers, and the longevity of his spans are unmatched in a state not known for durable covered bridges by eastern standards.

The first such Oregon bridge built by A. S. Miller and Sons was the 1873 Clackamas River bridge near Oregon City, a replacement of one which washed out in the spring of 1872. The wayward bridge had floated into the Willamette River, past bridgeless Portland, sailed into the Columbia and finally came to rest near Kalama, Washington, nearly fifty miles from its 'berth' at Oregon City. After plotting its devious course, the *Oregonian* (April 19, 1872) suggested that "should any of the enterprising people of [Clackamas] county desire to recover it, they will know where to look." The local citizenry could afford to ignore the *Oregonian's* taunts, for Portlanders still had to cross the river by ferryboat.

In the spring of 1873 the Clackamas County Court advertised for construction bids for a new bridge to be built just

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their grandfather, A. S. Miller. This includes portions of a diary kept by H. B. Miller, a photo of A. S. Miller, obituaries, miscellaneous family papers, as well as personal recollections. Miller's activities in Oregon (from 1873 through the mid-1880s) are very frequently recorded in Willamette Valley newspapers. See *Oregon State Journal*, Albany *Democrat*, *Oregon City Enterprise*, and *Oregonian*. Portland city directories and the U. S. census reports have been helpful in outlining his career. See also U. S. Patent Office Record, National Archives, for documentation of the Smith Patent Bridge Truss, Letters Patent No. 66, 900, July 16, 1867, which Miller used so successfully in Oregon. The Commissioners Journals for Lane County (preserved at the Lane County Courthouse) are especially informative with respect to Miller's bridges in that county.

below the Clackamas Railroad Bridge. A. S. Miller had evidently convinced the court of certain Smith patent truss advantages, because bids were allowed on only two designs, the Smith truss or that of the wayward original, known as the old Fendal C. Cason Bridge. The former would involve a 210-foot Smith truss; the Cason bridge had consisted of two 110-foot spans.

The contract was to be let "to the lowest responsible bidder at public outcry at the Court House door," on Monday June 2, 1873, at 1:00 p.m., it was granted to Miller, representing the Pacific Bridge Company (of San Francisco), for $5,205. It "will be the cheapest bridge the county could have erected," commented the Oregon City *Enterprise*, upon awarding of the contract to Miller.[16]

By July, work was well under way. The larger chords were cut and hewn on the site, with lesser members hauled from Oregon City. Miller built the truss five feet longer than was called for in the proposal with a clear span of 215 feet, total length 356 feet, eight inches, including approaches. Piers were built crib-fashion and filled with stone. By mid-September, 1873, truss work was finished, and the first of A. S. Miller's remarkable Oregon bridges was about to be covered. During construction, A. S. Miller and his son, H. B. Miller, stayed in the old John McLoughlin house, then operated as a boarding house.

Not only did the 215-foot span mark the longest built in the state, but the truss height and width, twenty-two by twenty-two feet, were unusual in that most bridges barely complied with the sixteen-foot minimum required by law. Both the *Enterprise* and *Oregonian* carried accounts of its completion in early October, 1873. With justifiable pride, they announced, "It is a magnificent structure, and is a credit to the county. It will be a great convenience to the traveling public." Final cost was $5,730, including $258.30 for superintendent Cason.[17]

Despite Miller's success at Oregon City, no immediate bridge prospects were in the offing, although he had made a tentative proposition to Lane County bridge interests.

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[16] *Oregon City Enterprise*, May 9, 1873, 3; June 6, 1873, 3.

[17] *Oregon City Enterprise*, October 3, 1873, 3; October 17, 1873, 3. See also *Oregonian* (Portland), October 4, 1873, 3.

In October, 1873, he returned to California for a brief contracting venture with the Pacific Bridge Company. While there he briefly worked on a dam in Yolo County, but events in Oregon were moving toward his recall as bridge builder.

There had been considerable agitation in Lane County to replace the old toll ferries with bridges. Two bridges were anticipated, one across the Willamette at Springfield, and another in the Mohawk Valley at the old Hayden ferry crossing of the McKenzie River.

While in California, Miller had not lost touch with the impending projects in Lane County. In fact, he had done such an advance job of salesmanship, that he virtually had the jobs "in the pocket."

By January, 1874, several months before his return from California, the Lane County Court determined that both spans were to be built on the "plan of Smith's patent Truss bridge."[18] As Miller had exclusive rights to its use, he was in a pleasant situation.

He sailed for Portland in April 1874, together with his two sons. They located at Springfield on May 10, and after final contract negotiations, commenced construction of the bridge at that place. In company with them was Lee Hoffman (also from California), who later organized his own bridge contracting firm in Portland.

With the Springfield bridge well under way, Miller's crew undertook the Hayden Bridge, and pushed both jobs simultaneously. The county court had agreed to pay but one-half the contract price, while interested citizens were to subscribe the balance. This policy, common at the time, normally forced the contractor in the collection business to insure full payment, but the Lane County Court simplified this task for Miller by appointing A. G. Hovey, later a Eugene banker, as collector of subscriptions.

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[18] Lane County Commissioners Journal, Vol. 3: 364-66, January term, 1874 (Lane County Courthouse).

By September 10, 1874, Miller's Springfield span had been finished and covered, accepted by the commissioners, and paid for to the extent of $5,300, half the contract price, which left the county $1,000 in debt.[19]

The Springfield bridge surpassed the Clackamas River span by fifteen feet, being a 230-foot clear span without the benefit of supplementary arches, as were common in the East. Despite the loquacious editorial praises concerning this, "one of the finest bridges in the State," the traveling public enjoyed its convenience for little more than six years, when it went out in the 1881 flood.

A. S. Miller's other contract during the summer of 1874 was the previously mentioned McKenzie River bridge at the site of Hayden's Ferry, several miles northeast of Springfield. The court-appointed superintendent to protect the taxpayers' interests in this job was the well-known Portland pioneer architect, W. W. Piper.

Professional competition had forced Piper into a temporary retirement to his 'ranch' in the Mohawk Valley, and he was thus readily available to look after the county's investment in that area. It seems rather ironical that Piper, designer of such edifices as the Multnomah County Courthouse, the Marion County Courthouse, Ankeny's New Market Theatre in Portland and the University of Oregon's first building, was cast in the role as a mere bridge superintendent, for which he was paid $150.

Following Piper's approval of the work in November, 1874, A. S. Miller was allowed $3,325, half the contract price the balance as usual by popular subscription. The Hayden Bridge, as it was called, was identical in span to the earlier Clackamas River bridge, that is, a 215-foot Smith truss, but more fortunate in that it was not replaced until 1927.

Following completion of these two bridges, A. S. Miller and sons returned by overland stage to California, where they built a bridge at Lodi and another near Visalia.

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[19] *Oregon State Journal*, August 22, 1874, 3; September 12, 1874, 3. See also Lane County Commissioners Journals, 3:410, September 10, 1874; *Eugene City Guard*, September 12, 1874, 3.

In the meantime, Eugene citizens not to be outdone by their Springfield neighbors, resolved to have a bridge to serve the Willamette Forks area. Several years earlier in fact, local agitation for a bridge at Eugene City had been such that several prominent persons including George H. Armitage, C. W. Young, J. E. P. Withers, J. E. Stevens, A. G. Bogart, and others, had filed articles of incorporation for the Eugene Bridge Company, but without any direct results. This was nothing new since a similar incorporation was attempted as early as 1857. The *Oregon State Journal* lent assistance in its columns, and complained that Mohawk trade was being lost to Harrisburg because of the undependable and costly ferries required to bring farm produce into Eugene City markets.[20] During A. S. Miller's brief removal to California, the Eugene 'bridge fever' reached the point where Miller was contacted to furnish a "proposition." With its acceptance, Miller returned to Oregon, this time on a permanent basis, and launched into a notable and productive career.

Upon his return in February 1875, he rented office space in Eugene City with the announced intention of making that place his headquarters, "while soliciting the work of constructing bridges throughout the State."[21]

The debt-ridden Lane County Court, besieged from all sides, finally placated the local interests by committing the tax rolls to a bridge at the county seat, to be located just below the ferry. While obligating itself to half the cost, the court renounced any responsibility for the collection of the other half.[22]

County specifications for the Eugene City bridge, ghost-written by A. S. Miller, called for two spans, 230 feet and eighty-five feet, both covered, with aprons bringing the total length to 600 feet. Miller had done such an advance job of selling the merits of the Smith patent truss that the county commissioners were disposed to protect Miller from excessive royalty payments on the truss, all set down in a most revealing manner:

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[20] *Oregon State Journal*, February 1, 1873, 3.

[21] *Eugene City Guard*, February 25, 1875, 3.

[22] Lane County Commissioners Journals, 3:450-51, May 7, 1875.

> At this time after consideration by the Court it is ordered that the Bridge across the Willamette River at Eugene City, be built on the plan of the Smith's patent truss bridge, on a condition that not more than one dollar & a half per foot for main span, & one dollar per foot for the short span, for the royalty, shall be charged to the contractor by the patentee, and it is further ordered that the plan and specification of A. S. Miller & Sons now on file herein be & the same are hereby adopted as the plan & specification of said Bridge, on condition that not a greater sum than $100.00 is charged to the contractor for said plans & specifications.[23]

Although Miller had been associated with the Pacific Bridge Company of San Francisco, he severed his connections with that office and henceforth operated quite independently, with both firms thereafter claiming the regional franchise to the Smith truss. There were four bidders on this job, including the Pacific Bridge Company, but the "public outcry" of bids at the courthouse door on July 10, 1875, was more in the nature of a solo, the contract going to A. S. Miller & Sons for $10,200. For some unknown reason, completion date was set at September 1876, perhaps to allow the county time for another tax harvest. At any rate, Miller did not even start the bridge during the balance of 1875.

In the meantime, Miller was expanding his field of operations, and had secured a contract for building the Santiam bridge near Lebanon, a $9,500 job that was finished before December 1, 1875.

With the spring of 1876, preparations for the Eugene bridge began in earnest, and Miller's bridge carpenters moved his 2,000-pound pile-driver into location just below the ferry. The driving of piles commenced on May 18, and hopes were high that the bridge would be completed for the wheat harvest.

Hopes were soon cast to the wind however. First, a temporary suspension of work was called for want of lumber, and work was stopped by a disgruntled citizen who served an injunction upon the builders, demanding a $500 right of way price for use of his land. When the county removed that obstacle, Miller attempted to recoup the lost time by putting thirteen men on the job, a big crew for the times. To everyone's surprise, the structure was finished except for painting during the first week of September. The two covered spans, 230 feet and eighty-five feet, built in less than three months, left no doubt as to Miller's ability, and public opinion in Eugene boasted that "The structure is highly creditable to the contractors, A. S. Miller & Sons, and prove [*sic*] conclusively that they are men of experience and understand their business thoroughly."[24]

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[23] Lane County Commissioners Journals, 3:461, July 9, 1875.

In addition to the bridge of course, the most important product of that contract was in the person of Lord Nelson Roney, a young transplanted Ohioan, whose first job in the bridge building business was as carpenter for A. S. Miller on the Eugene bridge. Though he stayed with that firm for several years and worked up to foreman, the 1881 flood gave him the opportunity to strike out for himself and establish a career (discussed later) that became nothing short of remarkable.

Even before the Eugene bridge was completed A. S. Miller and Sons were off again to Linn County, this time to build the ill-fated Jefferson Bridge across the South Santiam. Miller's fame was well established in the Willamette Valley, for every bridge had been a success. His stature was something more than is accorded bridge builders today, for each contract was a community affair, with the citizenry subscribing directly and individually toward the replacement of the prosperity-retarding ferries. Thus it is understandable that the Jefferson bridge-building disaster was considered real news, the particulars of which were printed in several valley newspapers. A local witness to the accident, writing under a typical nineteenth century pseudonym of "Zero," furnished all the details for this well-documented incident as follows:

> The bridge is being built by A. S. Miller & Sons, of Eugene City. It consists of two spans, one being 190 feet, the other 170. The longer span is already raised, and the false work removed. The false work for the other span was braced *only* to the pier, as the abutment was not finished. When the abutment was completed, and the raising of

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[24] *Oregon State Journal*, September 2, 1876, p. 3.

> the span began, the additional bracing of the false work to the abutment was overlooked. The end of the span over the abutment was twenty inches lower than the end over the pier, which would give the whole span a tendency toward the abutment.
>
> At the time of the accident, the top chord on one side was up, and about one-third on the other side. No one knows just what caused the false work to give way; but, without a moment's warning, the whole span shot endways toward the abutment. Henry Kohler and John Migley [*sic*] were on the top chord, which was finished; Nelson Rooney [*sic*] and Henry Miller on the one which was unfinished, forty-four feet above water. Aleck Burgess, Ed Rooney [*sic*], Will Hawchett, Wm. Crabtree, Mike McQueen, Herman Garike, and a visitor named Devany, were on the bottom chord, twenty-eight feet above the water. Every man went down amidst the breaking and crashing of falling timber. Kohler and Migley [*sic*] were landed upon the ground almost unhurt. Ed Rooney [*sic*] and Miller were thrown into five feet of swift running water. Rooney [*sic*] was badly but not fatally cut in several places about the head, — his worst injury being a broken nose. He was carried a hundred yards below the wreck and was rescued just in time to be saved from drowning. Miller received a cut on the head and a concussion on the back sufficient to prevent the use of his lower limbs for some time. Nelson Rooney [*sic*] had three ribs broken, a bad cut on the chin, and other serious, but still not fatal injuries. Burgess received severe cuts about the head and face. McQueen's injury consists of a broken thigh. One of Crabtree's legs was badly bruised, but not broken. The others escaped with slight injury.
>
> The verdict of all who have seen the wreck is, "What a wonder that every man was not killed!" Nelson Rooney [*sic*], Miller and McQueen are now the only ones confined, and from present prospects each bids fair to a perfect recovery in the course of time.
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> The loss, as estimated by the contractor, will not exceed fifteen hundred dollars. The wreck has been cleared away and reconstruction is progressing rapidly, and without further delay will be completed by the 1st of November.[25]

The Miller mentioned above was Henry B. Miller, son of A. S. Miller, and one of the principals of the firm. Young Henry had been married but a year, and was still hobbling around on crutches as a result of the accident, when a baby presented itself to the newlyweds.

Nels Roney's enthusiasm for bridge carpentering lessened considerably after the accident, and a year passed before he was ready to face the occupational hazards of his chosen trade. A. S. Miller's crews had other close calls, but no more so than did other contractors. In fact, early Oregon bridge-building accounts are frequently spotted with fatal accidents, usually that of a hapless carpenter falling from the trusswork, resulting in a broken neck.

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[25] *Eugene City Guard*, October 7, 1876, 3. See also *Oregonian*, October 4, 1876, 3; *Oregon State Journal*, September 30, 1876, 3.

From their Eugene office, Miller and Sons advertised that they were prepared to do all kinds of bridge and mechanical drafting. Their enterprise was rewarded by the contract for a fourth Lane County bridge across the Coast Fork Willamette River, near Pleasant Hill. It consisted of two 160-foot spans and one of seventy feet, with 140 feet of approaches.

The longer spans were described as "circle trusses," believed to be a new design, made by a combination of an arch and truss. In the columns of a local paper, it was claimed to have been ". . . invented by A. S. Miller & Sons and will be a fair representation of their knowledge of the science of bridge building."[26] Actually, it was a modified Burr truss, long used in the East, and readily constructed from the then available bridge-building treatises. Just why Miller chose such a design for the modest 160-foot span, and saved the less conservative Smith truss for his 230-foot bridges, remains a mystery.

During construction of the Coast Fork bridge, a Eugene editor reminded his readers that they had something to show for their 'high' taxes: "Linn, Marion and Multnomah [counties] can boast of their fine court houses and their wealth, but for good bridges we take the prize."[27]

The "circle-truss," so-called by virtue of the 'science' involved, did not enjoy any immunity from flood waters however, and it went out in 1890.

The last long truss of the 230-foot length to be built in Lane County by A. S. Miller was the "Spores Ferry" bridge over the McKenzie, located just south of Coburg. Despite its high cost, exceeding $10,000, the bridge was considered an economic necessity to Eugene merchants, since Mohawk

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[26] *Oregon State Journal*, June 2, 1877, 3. See also *Oregonian*, June 2, 1877, 3.

[27] *Oregon State Journal*, June 23, 1877, 2.

Valley farmers still refused to bring their products to Eugene City in favor of distant Harrisburg, because of the erratic ferry operating across the McKenzie.

During construction of this 230-foot "neat, tasty, and explicit" bridge, a local paper advised the rest of the state that

> This makes the third span of this length in the State; they being the longest spans of wooden bridges west of the Rocky Mountains. Lane county may well be proud of her majestic bridges, having more money invested in bridges than the balance of the entire State. It has cost us something to get rid of our ferries; but the people are glad they are gone and would not have them remain for double the price of removing them.[28]

One of Miller's best-known and long-lived bridges was also constructed during this period. It was the so-called Knight's Bridge across the Molalla River near Canby, built to replace the old Joselyn Bridge. The contract was let to A. S. Miller & Sons in March, 1877.

Miller's first Oregon covered bridge had been in Clackamas County, and it was there that he first used the Smith truss. In this instance, the plans of a local favorite son, A. J. Cason, were adopted by the Clackamas County Court, and Cason was appointed as superintendent. Cason was determined to pattern the design after the old Fendal C. Cason Bridge near Oregon City which had washed out several years earlier. He had intended to replace that span in kind, but Miller's Smith truss won the contract.

Now as bridge superintendent, empowered to utilize his own design, bidders were obliged to follow his plan. And a strange plan it was. One span of eighty-seven feet was a modified Howe truss, but the longer 123-foot span followed a self-styled "arch-brace" principle, using the bridge terminology of the period. It was not a true arch, but rather consisted of long diagonal braces spanning several panel points. High bending moments were introduced in the diagonals by the hanging of tension rods between the joints.

Although the bridge has been frequently misdated as 1876, Cason's plan was not accepted by the court until February of 1877. Miller's bid of $3,500 was low, and the contract let in late March. Work began in May 1877, and was finished in September of the same year. Some difficulty was experienced in obtaining "sticks" long enough for the lower chords. It was common to fell several trees before securing one that did not break. In this case, the trees were cut along the old territorial road in the Riverside District. Smaller members were cut at a local sawmill and hauled several miles to the site.

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[28] *Oregon State Journal*, April 27, 1878, 3; July 7, 1877, 3.

When finished, Cason's plan had one major flaw: the bridge covering was too low, and soon after opening the span to traffic, farmers wrote complaining letters to the *Oregon City Enterprise.* The editor summarized complaints on November 22, 1877:

> Considerable dissatisfaction exists in regard to the new bridge across the Molalla, near Canby. The 'girts' are so low that it is almost impossible to cross with a fair load of hay, and with threshers, the wheels have to be taken off and the machine dragged through. Can't the County Court have this defect remedied?

Despite the technical and practical shortcomings, Knight's Bridge served long past its contemporaries. Though finally condemned to vehicular traffic, and replaced with a modern span, it was preserved as a foot bridge. After seventy years of service, Knight's Bridge was blown into the Molalla River during a severe windstorm on February 1, 1947.

A seventy-year life span is brief by eastern standards, but it stands unequalled among Oregon covered bridges. It had become a part of the landscape, and was sketched, painted, photographed, and memorialized in verse and prose.

In 1878, Miller & Sons moved their offices from Eugene to Albany, where they secured a Linn County contract for the Rose's Ferry bridge, across the South Santiam between Albany and Scio. It was a typical Miller bridge with a 230-foot Smith patent truss, but with an eighty-foot span at each end, and 200 feet of approaches, totaling 590 feet, 275 feet of which were under cover. Built at a cost of $12,000, the Albany *Democrat* boasted of its being "the most expensive public bridge in this state." Included in the same contract was an eighty-foot span over a nearby slough. Altogether, over 300,000 feet of lumber were consumed under that contract.[29]

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[29] Quotation from *Albany Democrat* reprinted in *Oregon State Journal*, October 5, 1878, 3.

Miller's next major interest was in the proposed Portland toll bridge, a nebulous project that commanded the city's attention for two decades. In the course of his concern with this bridge, Miller opened an office in Portland during the fall of 1878.

A year earlier, while still in Eugene, Miller had offered a proposal, binding himself with "ample security," to span the Willamette at Portland with Smith trusses. The stakes were too high for other bridge builders to sit by idly, and the Pacific Bridge Company of San Francisco countered by claiming exclusive rights to the Smith truss. Miller had long since severed connections with the Pacific Bridge Company, and had been claiming a personal franchise with the Smith truss interests for Oregon and Washington Territory. Apparently shaken by the turn of events, Miller offered another proposal in 1878, using Howe trusses with five covered spans at 200 feet each with a 250-foot draw span. Nothing came of this, and another decade was to pass before a bridge materialized at Portland, but it was an open affair of wood and iron.

The 1880 Portland census takers found both A. S. and H. B. Miller in residence there. They had established themselves an office in the Union Block, newest and most elegant building in Portland, and were now prepared to bid on bridge construction anywhere in the Pacific Northwest. Their activities extended from Portland over to Walla Walla, and into eastern Oregon.

Unfortunately for the Millers, bridge building in the 1880s had become big business, and the advantage of a monopoly in Smith trusses was no longer a factor. The 1881 flood resulted in a brief flurry of business, but the Portland directory for that year listed four other bridge builders, so that real competition was felt for the first time. In April 1881, H. B. Miller wrote a gloomy note to John Kelly of Eugene: "We are doing plenty of work, but it is at such low rates that we are barely keeping even." By November the outlook was even less cheerful: "We do not see anything of importance ahead of us in the bridge line. In fact, future prospects in our line is rather blue."[30]

The firm advertised in valley newspapers without much success. Their last major contract was for building railroad bridges and trestles when the main line south was extended from Roseburg to Ashland. That work was completed about 1883.

By 1885 the A. S. Miller firm was no longer listed in the Portland directories. Miller retired from the business, and the leadership in Oregon bridge building passed to the newly organized Portland branch of the Pacific Bridge Company, and also the energetic team of Hoffman and Bates. Lee Hoffman first worked in Oregon with A. S. Miller on the Springfield bridge in 1874.[31]

A. S. Miller died at Albany in 1909. His son, Henry B. Miller, removed to Grants Pass where he established a lumber and millwork business. He represented Josephine County in the state legislature, and later became president of Oregon Agricultural College. Before his death in 1921, he was in United States Consular Service for a variety of foreign assignments.

The other son, Frank J. Miller, following dissolution of the firm, continued as bridge builder for another decade. For a time, he represented the San Francisco Bridge Company and secured contracts throughout Oregon, but mostly for steel spans, including the 1890 Salem bridge and the 1891 Albany bridge.

Following the 1890 Lake Labish railroad bridge disaster, F. J. Miller was called to testify as an 'expert' regarding rail spans. In 1892 he was clerk of the Board of Oregon Railroad Commissioners. He became a state senator from Linn County

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30. H. B. Miller to John Kelly, April 10 and November 13, 1881, John Kelly Papers, University of Oregon Library.

31. Lee Hoffman and George Bates both worked for the Pacific Bridge Company, Portland Branch, before their partnership of the mid-1880s. An important account of bridge construction involving Hoffman, Bates, C. H. Gorrill and others, is in the business records (1880-1911) of the Pacific Bridge Company in the Oregon Historical Society Library. The late L. H. Hoffman, Portland contractor, generously allowed the author to study and use old photographs of Hoffman and Bates bridges.

and in 1898, was elected a trustee of Albany College. Before his death, he operated the Albany Iron Works, and occasionally contracted for local covered bridges, some of them using the then obsolete Smith patent truss.

With the passing of A. S. Miller's firm, the Oregon bridge business entered into a period of commercial construction. The budgets of Oregon counties continued to carry bridge building as a major item, but the newer spans utilized Howe trusses of more conservative proportions, and the business of bridge design while less empirical than before, was also less imaginative.

"A HIGHLY ORNAMENTAL STRUCTURE"

One of the most spectacular covered bridges ever designed in Oregon never got beyond the driving of a few piles. Almost as soon as Portland became settled on both sides of the Willamette River, there was agitation for a bridge. For, as a complainant wrote to the *Oregonian*, East Portlanders were virtually debarred from attending churches, lectures, theaters, and social gatherings from want of a bridge. "Are we not required to pay double fare whenever we cross [by ferry] after night?"[32]

Of course, no ordinary bridge could span the Willamette River at Portland. The river was wide, and also navigable, and government permission was necessary to bridge it.

Though Portland's editorial columns frequently referred to the need for a bridge, no serious proposals were entertained until the mid-1860s, when local citizens interested several California engineers, who drew plans.

In the spring of 1867, T. R. Brook, a civil engineer from San Francisco, surveyed the river bottom, and then furnished plans and estimates for a bridge. The proposal called for six spans, with a pivot draw, totaling 1,464 feet in length. The design was exactly like that of the Yolo Bridge at Sacramento, except for length. Brook's design and estimate suggested an expenditure of nearly $150,000.

Other engineers immediately took up the challenge. H. R. Leonard, a Sacramento engineer and bridge builder, claimed he could design and build a "good wooden bridge of the same width for $60 per foot." At that quotation the bridge could have been built for $87,840. But the *Oregonian* pointed out that labor and materials were cheaper in Oregon than in California. Perhaps the cost could be pared to $60,000. The editor hoped so.[33] For publicity purposes, drawings of the scheme were photographed by Joseph Buchtel, popular Portland cameraman, baseball player and fire buff.

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[32] *Oregonian*, May 19, 1877, 3.

The project languished for several years, but was temporarily revived when various Portland businessmen incorporated bridge building companies. One such group was the Portland Bridge Company, incorporated March 20, 1869, by Philip Wasserman, Henry Failing and L. M. Starr.

In 1870, Congress finally passed the enabling act for a bridge at Portland, but its actual construction would require a man with engineering knowledge and a flair for promotion. Such a man was H. R. Leonard, who left California for load of three tons per lineal foot, thus accommodating railroad Company to design several large railroad bridges. Two of Leonard's bridges were the first really large covered railroad bridges in the state. The first, consisting of two Howe trusses, each a 215-foot span with a center draw span of 240 feet, was known as the Harrisburg Railroad Bridge, and was the first bridge over the Willamette River. It was finished in 1871.

Leonard's next triumph, built in 1872, was the Umpqua railroad bridge. Larger than the Harrisburg construction, it consisted of five Howe truss spans of 160 feet.

The example of these two bridges aroused keen interest in Portland. Though a number of firms and persons were interested in the franchise, Leonard's name was foremost. He had received good publicity in the local papers, no freshets had as yet washed his bridges out, and his reputation as a builder of large bridges was well established.

A battle of words followed, the ammunition being letters to the newspapers directed toward the city council. As leading contender for the honor of building the bridge, Leonard was backed by wealthy businessmen, and joined forces professionally with W. W. Piper, well-known Portland architect. Together they drafted bridge plans.

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[33] *Oregonian,* May 25, 1867, 3.

Leonard built a twenty-foot model of his truss, and with a flourish submitted the plans to the city council, together with a ten thousand dollar completion bond backed by friends. The design called for seven 200-foot covered spans, with a partially covered draw span of 275 feet, powered by steam. Together with approaches, the length of the structure was 2,637 feet.

Leonard claimed that the structure could support a rolling load of three tons per lineal foot, thus accommodating railroad trains, a convenient feature and important for revenue. His twenty-five years of experience constituted his authority. His description of the bridge indicates the magnitude of his scheme. "The superstructure will be covered with tin, and weatherboarded on the outside, with open ventilation in the roof the entire length. To afford light by day there will be large windows every twenty feet. By night it will be illuminated with gas. The floor will be covered with Nicholson pavement, and the ends are to be properly inclosed by colonnades and ornamental gables. The footways will be furnished with six saloons—three on each side—for resting places." Leonard summed up the entire plan with the statement that the bridge "will be a highly ornamental structure, and will rank strictly first class as to architecture, stability, and commerce."[34]

The Portland City Council adopted the plans during August 1872, in the face of much protest from competitors. But popular opinion was with Leonard, Piper, and their associates. After a long delay, the San Francisco Board of the U. S. Army Engineers gave its approval, followed by that of the Secretary of War. Equipment was moved into place, piles brought in by barge and the work of driving them began in February, 1873.

At that critical moment came the financial panic of 1873, and the bubble burst. The council voided Leonard's franchise for failure to execute bond. The driven piles were abandoned, and became a menace to river navigation. A steamboat pulled them out, and the only trace of Leonard's ambitious project was an engraving of the bridge, prematurely published in *Samuel's Portland Directory* for 1873.

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[34] *Oregonian*, July 31, 1872, 3; August 14, 1872, 3.

Other schemes to bridge the Willamette at Portland were proposed, one of them based on Leonard and Piper plans. During the summer of 1878, A. L. Rumsey, a graduate of "both the scientific and engineering courses" at Ann Arbor, Michigan, and employed by A. S. Miller & Sons, who had just moved to Portland, proposed plans for a bridge. Drawn on a scale of one quarter inch to the foot, the designs consumed ten yards of paper. They called for five covered Howe trusses of 200 feet each, and one 250-foot draw, with a total length of 1,800 feet. An eight horse-power steam engine was to manipulate the draw.[35] Just why A. S. Miller abandoned his favorite Smith truss for this venture is not clear; perhaps it was related to his legal obligations to the Pacific Bridge Company. At any rate, this project also ended on the drawing board, together with many others advanced, until a successful bridge was finally built in 1886, although not officially opened until April 11, 1887. The winning bridge was, unfortunately, not a covered bridge, and Portland's opportunity to have a spectacular span of that type was forever lost.

"THREE YEARS, TWO MONTHS AND ONE DAY"

In some respects, the covered bridge resembled Noah's Ark. Built above normal high water, it was lifted from its bed only in times of severe flood. In Oregon, these floods occurred in December 1861, January 1881 and January-February of 1890.

The earliest record of destruction by water of a covered bridge was in 1853, when two Oregon City bridges were washed away. The deluge of 1861 had less effect on bridges than later floods only because there were fewer structures to be destroyed. According to the *Oregonian*, December 14,

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[35] *Oregonian*, June 11, 1878, 3; August 7, 1878, 3. See also *Oregon State Journal*, June 8, 1878, 3, and *Eugene City Guard*, November 23, 1878, 3.

1861, "All the bridges in Yamhill county are gone." The histories of Salem all refer to the 1861 flood as the worst in the city's history.

Destruction in 1861 was not confined to the Willamette Valley; the Rogue and Umpqua rivers produced their share of washouts. The Winchester bridge, across the North Umpqua, a covered toll bridge built in 1859 by the Moore brothers, was destroyed. According to Nathanial Evans, an eyewitness, "The flood rose overnight to the floor of the Winchester bridge, and then to the roof. The roof parted from the main structure, and went floating down stream, followed very shortly by the remainder of the bridge."[36]

The effect of the 1861 flood was a rush of bridge building in 1862. Marion County built six bridges, Linn County at least five.

The destruction wrought by the 1881 deluge was especially striking because of the large number of bridges built in the previous decade. It too, was a state-wide flood, extending into eastern Oregon. Some of the largest and most costly covered bridges were among the casualties. Flood news in Oregon papers was, in fact, largely confined to reports of bridge failures and reports of covered bridges observed floating downstream. Among the largest of the covered bridges lost was the Laughery Bridge across the Little Luckiamute in Polk County. The Springfield bridge, first wagon bridge over the Willamette, was the subject of a short obituary: "The Springfield bridge is a thing of the past. Instead of being three miles above Eugene it is three miles below."[37] Rock-filled piers and sturdy construction were no match for the raging rivers.

The MacKenzie River toll bridge also floated downstream in the 1881 flood, carrying with it the toll-keeper. "The McKenzie toll bridge was carried away on Friday. Mr. A. S. Powers was on the bridge at the time, and was carried down the river on it about half a mile, when he succeeded in making his escape on a drift, and by alternately swimming, wading and walking drift logs, he made his way to the shore and reached home in safety, but it was a narrow escape."[38]

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[36] Nathanial Evans, "Reminiscences of Southern Oregon Pioneers" (U. S. Historical Records Survey, n. p., n. d., mimeo.).

[37] *Oregon State Journal*, January 22, 1881, 3.

Blair's Bridge across the North Santiam River between Linn and Marion counties at Mehama was subjected to such severe pounding that one of the two spans resting on rock-filled abutments gave way and collapsed but, "the main span and last one was pushed off very gently, and came sweeping by [Mehama] with all the pride of a vessel."[39]

One effect of the 1881 flood was the redesign of many covered bridges, especially railroad bridges. Wooden railroad bridges on the North and South Santiam rivers had been badly damaged. Directors of the Oregonian Railway Company decided that rather than use the remaining portions they would rebuild, using a combination iron and wood truss, the iron for tension members. On January 18, 1881, the *Oregonian* published a glowing account of the improvement, citing the advantages of the combination truss, which was practically guaranteed by the Pacific Bridge Company to last twice as long as all-wood bridges. The opinion was based partially on the circumstances that an iron-and-wood railroad bridge had been built near Dallas in 1880, possibly the first in Oregon, and had withstood the flood, a novelty among its neighbors.

Once the flood receded, Oregonians became acutely conscious of their dependence on bridges. Public meetings were held to discuss the problem of replacing those lost. The Springfield bridge was one of the first replaced, the contract going to A. S. Miller & Sons at the sum of $14,275. County officials were only too aware of the cost, and even more aware of the fiscal consequences should this bridge fall. They insisted that the second structure should be permanent. When the bridge was completed, the local paper praised it in terms reminiscent of the eleventh chapter of Genesis: "The Springfield bridge is an immense structure, towering as high as the tall trees surrounding it. When it receives its roof it will be visible from a great distance on either side of the river. When a flood comes high enough to take that bridge away, it will either be a second deluge or the end of the world."[40]

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[38] *Oregon State Journal*, January 22, 1881, 3.

[39] *Oregonian*, January 14, 1881, 3.

The second deluge came sooner than expected—in 1890, and there were other natural enemies to plague the Springfield bridge. First of them were the speedsters of '86, about whom the paper complained: "There seems to be a special fascination to ride and drive through the bridge across the river at this place at full speed, most of it being done after night."[41] Another enemy was wind. The long roof and sides of the bridge, nearly four hundred feet of resistance, were exposed to the gales that blew from the southwest. In January 1890, when a rumor circulated that winter winds were about to scatter the Springfield bridge, county officers and local bridge builders went to inspect it. Damage was not as serious as reported. A week later, water did what wind had failed to do, and "The Springfield bridge passed Eugene again."

In terms of bridge destruction, the 1890 flood was most spectacular. Some of the largest bridges in the state floated away, either whole or in random lengths. The trusses usually held, but the piers eroded in the swift currents. The Coast Fork bridge, a combination arch and truss built by A. S. Miller, was destroyed. The Clackamas wagon bridge floated away. Portlanders watched nervously as their new Morrison Street bridge resisted the flood, the more anxious as remains of dozens of Willamette Valley bridges drifted by. The Salem bridge, three spans of 270, 230 and 200 feet, combination wood and iron, with timbers encased in sheet metal, the pride of Marion and Polk counties, representing an investment of over $50,000 (some of the amount unpaid) went to sea at the age of "Three Years, Two Months, and One Day."[42]

"BUILT BY L. N. RONEY"

Among the most important contributions of A. S. Miller & Sons to bridge building in Oregon was the person of Lord Nelson Roney, who in 1875 started his career as a bridge carpenter for that firm. After Roney's experience with the Millers, he turned professional bridge builder, his opportunity being afforded by the 1881 flood which washed out more than the usual number of spans. "Nels" Roney was probably the most productive covered bridge builder in Oregon's history, and continued as such until the middle 1920s, devoting fifty years of his life to the business. Even at the time of his death in 1944, several of his covered bridges stood as evidence of his conservative approach to bridge construction, and the last of many signs bearing the inscription, "Built by L. N. Roney," was not torn down until 1953.

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[40] *Oregon State Journal*, September 10, 1881, 5.

[41] *Oregon State Journal*, August 14, 1886, 5.

[42] *Statesman*, February 14, 1890, 3.

A native of Ohio, Roney came to Oregon about 1875, and first worked on the covered wooden Willamette River bridge built that year at Eugene by the Miller firm. Immediately after, he worked for them on the Jefferson Bridge, where Roney was badly injured when the construction framework collapsed.

This accident temporarily abated Roney's enthusiasm for bridges. He did odd jobs for a time, tried his hand at surveying, and took a trip east. On his return he resumed work with A. S. Miller, working on bridges throughout the Willamette Valley. In the capacity of head carpenter, Roney was in charge of building the 1880 Gazley Bridge near Canyonville, when President Rutherford B. Hayes passed by on his tour of the West. At that time Roseburg was the south terminus of the railroad, and the President together with the official party had to take the stage from Roseburg to Ashland. After leaving Roseburg, the party stopped at the Gazley Bridge construction, where they forded the South Umpqua, and the President shook hands with Roney and the bridge crew.

Apparently Roney's ability as head bridge carpenter for the Miller firm was in no way affected by his lack of formal education, and the 1881 flood gave him an opportunity to set out on his own. He returned to Eugene, where he competed against his former employer for the many contracts being let as a result of the flood. His low bid on the McKenzie River toll bridge marked the beginning of his professional career. Almost immediately he captured a share of the local work. His ability to underbid competitors was almost uncanny, and though he suffered occasional losses and construction washouts, he made a fair profit over the years. Hardly a year passed without several bridges by Roney, and in some years as many as six were started. Roney built nearly a hundred bridges, most of them covered. He dominated the Lane County bridge building business for twenty years.

Bridges were not the limit of Roney's interest. Paralleling his bridge activity was an impressive record of commercial, educational, religious, public and residential construction. He entered this field about 1885, and continued to 1910, constructing or remodeling over a hundred buildings. During the 1890s, nearly every public, commercial and religious building in Eugene and vicinity was a Nels Roney job.

Roney was so active that he usually had several buildings and bridges under construction at the same time. For a two-year period, 1886-88, he had a partner, W. H. Abrams; the rest of his career was mostly solitary.

L. N. Roney was a firm believer in covered bridges; in fact, late in his career when he was obliged to build several unhoused wooden trusses he went on record as opposing such construction.

One such unhoused bridge was also one of his bigger jobs: three Howe spans of 200 feet each across the Willamette River at Springfield, for the Portland, Eugene and Eastern interurban line. This bridge, built in 1910, was completed "in the record breaking time of 120 days." The big structure was considered a "model of architectural neatness," as it was "as straight as a die from one end to the other."

Lane County's "greatest and best bridge builder," publicly announced it a "pity to leave it uncovered, as it will last three times as long in this wet climate if it were protected from the rains."[43]

Roney was an ardent outdoorsman and usually managed to combine business with pleasure. Following the completion of some remotely located bridge, he would either fish or hunt his way back to his home at Eugene. His wife, Orilla, often joined him at the jobsite for a brief camping interlude, and then continued on to the nearest hot springs for a period of rustication. While Nels fished his way home, she returned by stage.

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[43] *Morning Register* (Eugene), October 6, 1910, 5.

Some of the credit for Roney's success must go to the faithful and competent carpenters under his employ. Worthy of note is Ira Walton, who joined Roney's forces in 1881, on Roney's first independent contract, and worked off and on until at least 1913. Walton, Roney's 'right hand man,' was badly injured that year during construction of the Jasper steel span, ending thirty-two years with Roney.

Nels Roney's activities in the covered bridge field included not only county work, but also railroad spans throughout the state and into California.

The final thirty years of Roney's life constitute a drawn-out tragedy, with political and personal reverses. He died aged ninety-one, a respected citizen, one of the great 'little men' of Oregon.[44]

L. N. Roney's bridge building practices were consistent and conservative. He nearly always used the Howe truss, and his spans never assumed daring lengths. He standardized his portal designs, following those of A. S. Miller, and they have become the "Lane County type." Roney was a good businessman, well liked by his associates and employees. He offered designs to his competitors when he was not interested in a contract. His ability to make a profit on a job even after leaving 'money on the table' demonstrates his perspicacity, and knowledge of his business. His written bridge specifications, even for his early bridges, are interesting and well-written documents.

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[44] Sources for the life of L. N. Roney are varied, but Eugene newspapers cover almost every facet of his career from the time he established residence in 1875 until his death in 1944. See especially *Oregon State Journal*, *Eugene City Guard*, and the *Morning Register*. See also Deed Books, County Commissioners Journals and bridge specifications, located at the Lane County Courthouse. Additional information on his early life is in H. K. Hines, *An Illustrated History of the State of Oregon* (Chicago, 1893), 584; *Portrait and Biographical Record of the Willamette Valley, Oregon* (Chicago, 1903), 1283; and Joseph Gaston, *Centennial History of Oregon, 1811-1912* (Chicago, 1912), II:196. For Roney's obituary, see the Eugene *Register-Guard*, November 25, 1944, 1. The author is grateful for personal interviews from the following acquaintances of Roney: Frank L. Armitage, Fred Fisk, J. F. Gerot, Mrs. Hugh Hampton, L. T. Harris, Lawrence Stillman Hunter, D. R. Husband, T. O. Russell, A. C. Striker, Earl Thompson and others.

In a state not known for its long-lived covered bridges, Roney's spans gave good service for their low cost. The life span of his bridges varied from six to sixty-three years, but the average life of nearly a hundred bridges exceeded thirty-five years. As one local observer commented after hearing a false rumor that one of Roney's bridges had washed out, "It is very unlikely. Mr. Roney's bridges have stood the test of hard floods."

NO DRINKING WAS PERMITTED

While no detailed accounts of covered bridge building in Oregon have survived from the nineteenth century, it is possible to reconstruct the process from scattered, fragmentary accounts in newspaper files. Once bridge-minded citizens persuaded a county court, and the budget appeared able to stand the strain, county commissioners advertised for plans, specifications, and bids for construction. Exact location of the bridge was determined by the court, or its "viewers." A superintendent was then appointed to let the contract at "public outcry," and supervise construction. A sort of 'clerk of the works,' the supervisor was usually a favorite son who lived close to the site. Ex-Governor John Whiteaker served as superintendent of a bridge across the Coast Fork of the Willamette River near Creswell, built by L. N. Roney in 1884.

Except as noted in the instance of A. S. Miller & Sons, early advertisements for bids seldom specified the exact type of construction. The details were usually up to the contractor. There were, however, two common types of construction generally followed, with variations of detail only. They were the Smith patent truss, and the Howe truss. In 1870 W. H. Gorill, representing the Smith patent truss bridge visited Oregon to sell franchises. He carried with him a model to demonstrate the principle, and was prepared to explain the virtues of the type. He claimed that some of the longest spans in the United States used the Smith patent.

Erection of the bridge, whatever type, was easier than acquisition of the contract. Armed with practical skill at carpentry and with a pragmatic knowledge of structural engineering, a bridge builder could obtain at or near his site most of the raw materials needed for construction.

With all their skills, the early bridge builders seem to have been accident-prone. Hardly a year passed without several reports of bridge construction accidents, some of them fatal. An 1867 report reads: "Last Tuesday while the new bridge on the road from Monmouth to Eola, over the Rickreal [*sic*] was being raised, Mr. Ira Mason, son of the contractor, fell backward from the top of a bent, head foremost, and struck a mud-sill fifteen feet below, instantly breaking his neck."[45] During the 1872 construction of the North Umpqua railroad bridge near Roseburg, carpenter Henry Kohler fell from the upper chord, causing such injuries that he was not expected to live. However, the unfortunate Mr. Kohler survived this accident only to experience another, the harrowing falsework failure from under the 1876 Jefferson Bridge which has already been cited in detail.

In 1877, a bridge being built at Monroe, in Benton County, collapsed with a number of persons, badly injuring several.

Nor were bridge builders exempt from acts of God, which not only caused loss of time and investment, but tragedy on several occasions. The Pacific Bridge Company lost the Santiam bridge at Scio, in 1881, when wind blew the construction down, killing one man and injuring three. Nels Roney's entire falsework for a Row River bridge went out in the 1883 freshet.

While the Albany steel bridge was under way in 1891, A. S. Miller, though retired, was acting as superintendent during his son's absence and inspecting piers from a rowboat which capsized, nearly drowning Mr. Miller and another man. Such occupational bridge building hazards exist today of course, but they are materially reduced by the safety engineers, union safety requirements, state industrial accident commissions and workmen's compensation. The nineteenth century bridge carpenter could expect no recompense for loss of time or bodily injury.

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[45] *Salem Daily Record,* June 23, 1867, 2.

Some bridge builders seem to have been careless in other respects, inviting charges of fraud. A February 1, 1873, petition to the Marion County commissioners signed by twenty-two citizens including A. J. Cason, complained that the bridge on the Abiqua, north of Silverton, was fraudulently constructed. They charged that the bridge was not built according to specifications, was three feet lower at the south end and two feet lower at the north end than the old bridge had been, that the contractors used twenty-seven sticks of timber from the old bridge, and that the bridge was covered with cedar boards instead of shingles. The petition finally pointed out that the contractors "sold the old iron to themselfs for 2 cts per lb when Iron is selling from 8 to 12 cts per lb."[46]

Arthur C. Striker, who worked on a construction crew superintended by his father, Aaron Noble Striker, bridge contractor, has described the erection of a covered bridge at Horse Creek, about fifty-five miles up the McKenzie from Eugene.

When the contract was let in 1902, wagons with tools and equipment set out for the bridge site, where a camp was set up. A partial list of tools includes axes, adzes, shovels, picks, hand saws, splitting froes, sledges, splitting mauls, dollies, truss rods, augers, jacks, peavies, hammers, nails, ropes, hand winches, drift pins, rifles, shotguns, and fishing equipment. No lumber was taken, because all such material was available at the site, where even the shingles and clapboards were rived. About six to eight men were required for the job, their pay scale being $2.50 per day, and every man was expected to be able to perform any part of the work necessary.

> Bents were put on each side of the river. Heavy cedar logs were placed on level bedrock if possible, and drifted. Several holes were bored through the logs, and steel drift pins were driven in and through to the rock. The main posts were dapped into the mud sills, and dapped into the cap. Instead of sway braces, we placed diagonal

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[46] Manuscript petition, "To the Honorable County Judge & Commissioners of Marion County, Oregon," February 1, 1873, in Special Collections, University of Oregon Library.

> posts inside of end posts and main bents. The posts were leveled, and sawed off before being capped.
>
> After the bent was put in, the lower falsework went up, and work on the truss was started. After we placed the lower chord, we set the upper chord on the falsework directly above the lower chord, about fourteen feet. Then we placed diagonals between the two chords. At each panel we put in cross-ties on the upper chords, then dropped in rods, and tightened. A hand winch was used for raising diagonals and upper chords.
>
> The next step was to swing the truss, which meant to tighten the truss rods, first at one end, then at the other, working toward the center. Then the useable lumber was salvaged from the falsework, and the remainder broken up to float downriver.

Striker's description of hand-hewing beams is easily understood. "First have a chalk line to hew to. Chop plumb notches, then slab off to the line. Score into the line, and hew to the face of the stick. When two faces are hewed, tip over, level, and draw line same as before."

Life in this bridge builder's camp was hearty. "There was plenty of fresh fish for the table, and game was plentiful. Fresh eggs and milk were often supplied by farmers. The food was plain, but it was wholesome and plentiful. A man from the crew would cook. He would prepare meals and all the men would help him wash the dishes. The cook would then join the crew and work on the bridge. The men fished some after supper, but usually went to bed early, having worked about a ten-hour day. No drinking was permitted in my father's crew, nor any profanity."[47]

". . . IT WOULD HAVE LASTED TWENTY YEARS"

The history of Oregon's covered railroad bridging is spotted with construction accidents and rapid obsolescense, but is also replete with a goodly amount of success and a flair for the spectacular. Few railroad spans were built before the late 1860s and they were seldom covered. In November of 1869, the then new Oregon and California railroad bridge across the Clackamas River was carried away by high water, owing to its "bad location." The timbers were salvaged and immediately rebuilt. By year's end, the bridge narrowly escaped a worse fate at the hands of an arsonist who nursed some sort of a personal grudge against the 'land hungry' railroad expansionists. By 1870 the O & C built another bridge across the Pudding River just north of Aurora, but these bridges were not covered.

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[47] Extracts from personal interviews and correspondence, Arthur C. Striker, Florence, Oregon.

Oregon's earliest covered rail span of real importance was also the first bridge of any kind to cross the Willamette River. When the Oregon and California Railroad extended its line down the valley, the Harrisburg crossing provided the opportunity for building the longest covered bridge in the state.

In the summer of 1871, a contract for building the Harrisburg bridge was let to J. B. Montgomery. Design and supervision was entrusted to Col. H. R. Leonard, civil engineer and bridge builder, recently removed from Sacramento. Leonard's design called for prefabrication of two Howe trusses each to be 215 feet long with a 240-foot draw span in the middle, and a fifty-foot pony truss at each end, giving a total length of 770 feet. All this was erected in the then amazing time of three months and seven days.

On October 3, 1871, the first train of ten cars crossed over carrying a 120-ton pay load with "no strain." The event was heralded throughout the valley, and Leonard's fame was locally assured.[48]

Colonel Leonard followed that success with a more impressive achievement. His design for the North Umpqua railroad bridge enabled the O & C to close the gap to Roseburg. When finished in the summer of 1872, the bridge was well over 1,000 feet long, consisting of five Howe trusses at 160 feet each, a sixty-foot pony truss, and 270 feet of trestle work, the whole being framed at Comstock's mill in northern Douglas County.

The *Plaindealer* boasted that completion of the bridge would bring the sound of locomotives within earshot of Roseburg. The first train crossed over in October, 1872, an event celebrated with enthusiasm in southern Oregon. The modest Mr. Leonard, "architect" and contractor, attributed the "superiority" of this bridge "over any other on the road" to the use of his balance wrench, "by which the strain on every bar is equally and accurately adjusted."[49]

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[48] *Oregonian*, October 5, 1871, 3.

Leonard's last venture into Oregon covered bridge superlatives was his highly promoted but ill-fated project for a covered Willamette crossing at Portland in 1872-73, described earlier. When the scheme collapsed into the financial abyss of the 1873 panic, Leonard's drop into obscurity was almost as sudden as his rise to fame. He returned to California.[50]

Covered railroad bridging continued with the extension of new lines until the flood of 1881. By that time those timber spans which were not washed out, were rapidly becoming obsolete in terms of heavier rolling stock.

In 1880, the Pacific Bridge Company had built a combination iron-and-wood railroad bridge near Dallas, which successfully withstood the flood, perhaps by virtue of its newness, while many of the older wooden rail spans had gone out, especially on the North and South Santiam rivers. Following the flood, most railroad engineers advised rebuilding with the combination wood-and-iron type of bridge. This decision was bolstered by the Pacific Bridge Company's guaranty that their "combination" bridge would last "twice as long" as wooden bridges. While that firm was building one of their first such bridges, across the North Santiam near Scio, a high wind blew down the 260-foot span which was still on its falsework. One carpenter was killed and two others were injured. Despite the awkward construction techniques required, the combination iron-and-wood bridge was quickly accepted on a state-wide basis after 1881. Most of the work was going to either the Pacific Bridge Company or Hoffman and Bates, both firms specializing in the combination iron-and-wooden railroad bridges.

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[49] *Plaindealer* (Roseburg), August 23, 1872, 3; October 4, 1872, 3. See also *Oregonian*, August 14, 1872, 3.

[50] The brief but colorful Oregon career of H. R. Leonard can be gleaned from numerous accounts in the Roseburg *Plaindealer* and the *Oregonian*. Prior to his Oregon projects, Leonard is listed as a Sacramento architect in Henry G. Langley's 1864 *Pacific Coast Business Directory*. For further documentation of his effort to organize the Portland Bridge Company, see *Biennial Report of the Secretary of State of the State of Oregon* (in *Messages and Documents*, 1872), "Articles of Incorporation," Appendix, 22. See also Portland City Council Ordinances for 1872-73. After leaving Oregon, Leonard is to be found listed as a San Francisco architect in L. M. McKenney's *Business Directory of the Pacific States and Territories for 1878* (San Francisco, 1878), 696.

The investigation which followed the Lake Labish disaster, put the covered bridge back in its proper perspective, and the public learned the facts regarding open bridges and trestles.

On November 12, 1890, the Lake Labish trestle, located five miles north of Salem, collapsed under the weight of a braking Southern Pacific train, killing four and injuring 125 others. The Oregon Railroad Commissioners began their investigation November 17, by seeking the answer to a deceptively simple question: was the bridge strong enough? They sought the testimony of expert bridge builders, including Lee Hoffman (Hoffman and Bates), C. F. Swigert (Pacific Bridge Company), R. A. Habersham and W. B. Chase (bridge engineers), and Frank J. Miller (previously with A. S. Miller). The latter was before the board for three hours and fifteen minutes, testifying as an 'expert' bridge builder and engineer.

The board's main line of questioning was focused upon the fact that the bridge was not covered; therefore what was the life span of Douglas fir bridge timbers when left exposed to the western Oregon climate? Without exception the 'experts' testified that open railroad bridge truss designs were predicated on a life expectancy of ten to fifteen years.[51] This implied a similar life span for unhoused combination iron-and-wood railroad bridges. The investigation was responsible for a ruling which required all railroad bridges to be inspected twice annually, the results of which were published in the biennial reports of the Board of Railroad Commissioners.

The most notable covered railroad bridge to be built following the investigation, was the 1891 McKenzie River span near Coburg for the Southern Pacific Railroad. Prior to 1890 that branch of the Woodburn line was a narrow gauge affair which terminated at Coburg. Southern Pacific decided to relay the track for standard gauge equipment, and extend it to Springfield. This involved bridging the McKenzie about a mile south of Coburg.

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[51] Lake Labish Disaster Testimony, in *Second Biennial Report of the Railroad Commissioners of the State of Oregon* (Salem, 1891).

In the fall of 1890, a contract was let to Hoffman and Bates, but upon the death of Mr. Adler, their engineer, the contract was assigned to the Pacific Bridge Company. Work on the bridge itself was not begun until January of 1891, several months after the Lake Labish disaster deliberations. Instead of the usual combination truss, an all wooden span was housed and ready for crossing by June 15.

The Coburg railroad bridge has been frequently alluded to as the world's longest wooden rail span, but the facts of its length are not commensurate with its fame. Henry G. Tyrell's book *History of Bridge Engineering* (1911), pronounced it the longest wooden bridge in America, with a span of 380 feet (pp. 135, 149). The *Encyclopaedia Britannica* (1952) claimed it as the longest timber bridge in the world with a span of 380 feet, supposedly built in1926.

Actually, it was a 260-foot Howe truss with a sixty-foot pony truss at each end. The three spans certainly totaled 380 feet, but the center span did not exceed 260 feet. Furthermore it was built in 1890-91, not 1926. The bridge was replaced in 1907 after a short but useful life of only sixteen years, a victim of obsolescense. The re-used, pin-connected, 400-foot steel span which replaced it in 1907 is still in service.

Other covered rail spans with a 260-foot span had been built in Oregon prior to the Coburg bridge, so that it was not unique, but those bridges served only a few years due to the rapidly increasing weight of rolling stock between 1890 and 1900.

Actually, covered railroad bridges were not as common in Oregon as one might expect. Many of the short lines such as the Oregon, Pacific and Eastern which operated out of Cottage Grove, used wooden bridges, but usually they were not covered.

On June 5, 1909, an OP&E passenger train consisting of an engine and one coach, was crossing the Currin Bridge across the Row River, about five miles east of Cottage Grove.

The bridge, a ninety-foot unhoused truss, collapsed, as described in a report of the investigating committee. "The passenger coach fell into the river, about 25 feet, and was submerged in about six feet of water amid the broken pieces of the bridge. Seventeen passengers and two trainmen and one other employee were more or less severely injured."[52]

Although the bridge had been inspected prior to the accident and considered sound, the newness of the truss concealed signs of rot around the joints. Significantly, the Railroad Commission's report pointed out that "this was an uncovered bridge and had been built less than seven years. If it had been covered it would have lasted twenty years."[53]

All bridges on the line were covered after the accident, but the incident served as a dramatic object lesson in the false economies of bridge building.

Thereafter many covered railroad bridges were built in western Oregon, but most of them suffered the common fate of rapid obsolescence. Most of Oregon's extant covered railroad bridges date from the second decade of the twentieth century, so that safety factors are more nearly consistent with the applied live loads, and they receive regular maintenance. But while few are slated for immediate removal, they serve the transient needs of logging lines with little prospect for their renewal in kind. It seems most probable that the nemesis of Oregon's covered railroad bridges will be the shifting pattern of rail logging needs.[54]

"A GREAT IMPROVEMENT OVER THE OLD TUNNEL"

Destruction of an unusual number of covered bridges in the flood of 1890 hastened an already evident trend toward steel bridges. The experience of Springfield with its succession of covered wooden bridges was especially dramatic. Two bridges at the same site had lasted seven and nine years respectively before being washed away. The city then turned to steel bridges; a 400-foot span was erected by the Pacific Bridge Company in 1890.

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[52] *Third Annual Report of the Railroad Commission of Oregon to the Governor*, December 15, 1909 (Salem, 1910), 21.

[53] *Third Annual Report* . . . , Railroad Commission, 21.

[54] Pertinent changes in logging patterns include the abandonment or moving of lines when timber has been depleted in an area served by rail; the greater cost of modern covered-timber bridges as compared to concrete or steel, because of higher labor costs; the use of trucks for hauling out logs in new logging areas, because the initial cost is lower than that required for a rail line; the fact that the depletion of timbered areas is so rapid by virtue of trucking that the longer life of a covered bridge is not considered economical.

Salem also replaced its wood with steel. The high mortality rate of wooden bridges during the 1890 flood caused the Salem Board of Trade to adopt a resolution suggesting that the city build with more "permanent" materials than wood.

> Resolved, That it is the sense of this board of trade that the present condition of our main business street demands among other permanent improvements a substantial bridge over South Mill Creek on Commercial street, in place of the unsafe and unsightly old 'covered' bridge; that the new structure should be the full width of the street, without top braces, built of stone and steel or other imperishable material.[55]

The city fathers followed this resolution by preparing plans and specifications for a new bridge. When construction began in the spring of 1892, the April 15 *Statesman* expressed the growing sentiment against covered bridges when it stated: "This bridge will be a great improvement over the old tunnel which occupied a part of the site for so many years."

The trend thus accelerated gained momentum in the automobile age. Bridge building became more complex, and passed from the domain of the old-style bridge carpenter to companies specializing in light, steel prefabricated bridges. Wholesale destruction of wood bridges marked the change to 'modern' steel structures, often built at exorbitantly high prices.

In 1915 the newly-formed Oregon State Highway Commission investigated bridge construction, and concluded that most county courts were being victimized. "Bridge companies employ the smoothest talkers for their salesmen that can be obtained. The remedy for the evil that has grown up in the bridge business of the state is to have enacted a law requiring all bridges costing $500 or more to be built under the direct supervision of the State Highway Department."

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[55] *Statesman*, February 5, 1892.

Just before 1917 the counties abandoned many still useful covered bridges for tall, narrow, steel, pin-connected spans. Some of these are still standing on once-busy back roads. However, rapid changes in transportation made these 'modern' steel bridges obsolete in a few years. Ironically, some of the spindly steel bridges have been replaced with wooden, covered bridges. The most notable example is on Row River, several miles east of Cottage Grove, where a covered wooden bridge was built in 1950 to replace a condemned steel structure. Two years later the new bridge was housed, and stands today as one of the most modern covered bridges in the United States.

The twentieth century Oregon covered bridge is only a second cousin to the ones built by A. S. Miller, Lord Nelson Roney, and their contemporaries. Standardization of design was introduced by the State Highway Department. Covered bridges were made available in lengths to suit any creek or river. Technology supplanted empiricism. The rustic was replaced by the precise, and most of today's standing covered bridges are of the new type. The economic depression of the 1930s not only delayed replacement of many covered bridges, but actually fostered the bulk of Oregon's newer spans, as an economical solution to the county bridging and labor problems.

One of the first official statements regarding the usefulness of covered bridges is in the second annual report of the State Highway Engineer, E. I. Cantine, published in 1916.

> Timber bridges have been almost entirely supplanted by either steel or concrete in sections [of the country] where lumber costs $25.00 per thousand or more. In Oregon, however, where timber is the main industry and a good grade of structural timber may be had for $10.00 to $14.00 per thousand, there is still a large field in certain localities for timber structures, especially in localities along the coast where the salt air prevails. Timber bridges, however, should not be constructed at all, unless the structure is properly designed and constructed. Furthermore, all first-class timber bridges should be covered, as the best timber bridge that can be built cannot be depended upon to last more than 10 or 12 years without protection. Many bridges exist in Oregon that have been well cov-

ered, and in some cases re-covered for the third time and have seen from 30 to 40 years' service.[56]

The objections of this practical engineer to covered bridges reflect the changing times. He referred to their great fire hazard, stated that "covered bridges do not present a pleasing appearance. . . . They are convenient places for tramps and holdups; also many horses refuse to cross a covered bridge at night."

The first World War brought a resurgence of wooden covered bridges in Oregon, the opinion of highway engineers being overlooked in the general shortage of steel. The various 'patriotic and economic' reasons that forced the building of covered bridges from 1917 to 1924 led the highway department to solve the two major objections to such structures, "unsightliness" and dark interiors. The two Umpqua River bridges of 1918, one a mile north and the other two and a half miles south of Dillard were splendid forerunners of architectural design which became standard for bridge designs executed by the State Highway Department. "Open windows . . . light the spans and make a more artistic appearance, lack of light and unsightly appearance having been the chief objections to covered wooden bridges." Other innovations included laminated floors, asphaltic wearing surfaces, and interior whitewashing.[57]

In 1915 Lane County decided to continue to build wooden bridges notwithstanding the recommendations of two state engineers: "Lane County court is convinced that wooden bridges properly built will last as long as steel and they know the cost is much less."[58]

From 1918 to 1924 the state not only designed many and ambitious covered bridges for its own highways, but made its designs available for county use, a free service intended

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56. *Second Annual Report of the Engineer of the Oregon State Highway Commission* (Salem, 1916), 52-53.

57. *Third Biennial Report of the Oregon State Highway Commission* (Salem, 1919), 21, 98.

58. *Morning Register*, June 13, 1915, 2. For further discussion in this paper regarding wood versus steel, see January 5, 1915, 8; April 7, 1915, 5; April 8, 1915, 5; April 10, 1915, 3.

to produce a better bridge at less cost to the county, and eliminate the "slick bridge salesman."

Though standardization and other improvements meant a better covered timber bridge, it also put an end to such structures. The new bridges were so heavily constructed, with considerable cross-bracing and extra safety factors for heavy, modern traffic, that they became as complicated as steel bridges, slower to erect, and nearly as expensive. After 1924 few covered bridges were designed for state highway use, though plans were still furnished counties. Standardization had made it possible to "pull a bridge out of the drawer." By 1929 the late C. B. McCullough, noted bridge engineer of the highway department, could primly state that "The 'covered bridge' of a former generation was an unsightly thing, and the modern housed timber truss must not be confused with it or considered in the same class any more than the old time light pin-connected 'iron wagon bridge' on steel tubes is in the class of the modern steel highway span."[59] Despite these well-qualified observations concerning the covered bridge of a former generation, the covering alone often compensated for certain structural deficiencies.

The effect of covering on the quality of bridge timbers was efficiently demonstrated in a series of tests made from 1926 to 1928 by E. H. McAlister, Professor of Mechanics at the University of Oregon. Specimens were taken from the Currin Bridge over Row River, and the Hayden Bridge over the McKenzie when these structures were torn down in 1925 and 1927. Though none of the timbers had been treated with chemical preservative, they "were in an excellent state of preservation."

Professor McAlister reported:

> The Hayden bridge was erected in the summer of 1874; was immediately covered and kept covered throughout its life. The covering was a very common type—vertical boards on the sides, and a shingle roof. Considering the great abundance of first-class timber in these [*sic*] early days, it was anticipated that the timbers of this bridge would be found of uniformly high quality, but this was not the case. Some were first class, some were mediocre, and some were

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[59] C. B. McCullough, *Economics of Highway Bridge Types* (Chicago, 1929), 80-82.

> poor. At least three of the 12 specimens would have been rejected by modern grading rules from the class of bridge timbers—either because of bad knots in critical positions, or because of very low density (too little summer wood) or for cross grain.
>
> Not one of the old beams . . . broke in two at failure, as a brash stick does. On the contrary, after the maximum load was passed and the beams had failed in the technical sense, they were still capable of supporting from 35% to 60% of the maximum load.
>
> The timbers, after 53 years of service are undoubtedly stronger than they were when new. Douglas fir can be preserved in sound structural condition for at least half a century by the simple expedient of keeping it covered from the weather and providing for free circulation of air.[60]

A modern use of the covered bridge, unforeseeable until its inception, was as a highway marker. The earliest editions of the Portland Automobile Club *Tour Book* described and mapped the principal routes in the state, and in the absence of marked highways was obliged to refer to easily identifiable objects on or beside the road. Covered bridges were among the most striking landmarks an automobilist was likely to meet, and they were conscientiously listed. What was once a useful guide to the tourist has now become a guide to the location of the covered bridges, and the maps indicate that there were forty-seven of them on Oregon's main highways in 1912. Later motor logs employed the same device, until standard highway numbering was introduced.

The appeal of the covered bridge as something to see on an automobile tour has survived. In 1936 the Oregon State Highway Commission took an inventory of its rural roads, and included covered bridges among the items tabulated. At the time there were three hundred such bridges still standing. Twenty-six were on primary roads, eighteen on secondaries, and 256 on county roads. The majority of the state bridges were in good condition, but county spans were cited as fair to poor. In 1948 and 1952 the highway commission prepared mimeographed lists of Oregon covered bridges for the benefit of inquiring tourists and other interested persons. These lists were neither complete nor accurate, but indicated a change in attitude toward these structures, from practical to sentimental, from a sign of progress to a symbol of an age gone by.

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[60] E. H. McAlister, *Strength Tests of Old Douglas Fir Timbers* (Mathematics Series 1, No. 2, University of Oregon, 1930), *passim.*

Except as a subject for nostalgia and reminiscence, the Oregon covered bridge, whether of the old type or new, is a thing of the past. Even in the center of the nation's lumber industry, timber bridges cannot compete with steel and concrete. Lane County, first to build covered bridges on the grand scale, is the last to discontinue them. The county policy in Lane and elsewhere is to replace the covered bridge with concrete where the traffic patterns are believed to be fixed, or at least predictable in the foreseeable future. Each year the number of Oregon covered bridges is reduced. They are replaced, more often than not, with little consideration, esthetically or from a long range economic viewpoint. A concrete bridge merely becomes an extension of the highway, rather than a positive visual element in the ruralscape. Usually there are good reasons for the replacements. But there also are good arguments for preservation. The old wooden spans provide a link to the past and when all of Oregon's covered bridges are gone, an associable part of her past will have disappeared with them.

The retention of these old spans can be partially justified on an economic basis. They attract tourist dollars of course, since Oregon boasts the largest covered bridge census in the West. But they are also object lessons in pioneer history, geography and engineering, to say nothing of the charm associated with a hand-made but useful structure. The concrete or steel bridge does not offer a reasonable substitute for these intrinsic values. Anyone chancing upon a covered bridge along a country road has an opportunity to experience a feelable link with the past, in a sympathetic and often spectacular Oregon environment, an anachronism if you please, but a pleasant one, a translation of bygone needs into timbers, weatherboarding and shingles that we call the covered bridge.

ALBERT SEARLE MILLER 1821-1909

A. S. Miller was born in Massachusetts and lived in that state until about 1850, when he removed to Ohio and took up the trade of bridge building. While in Ohio, he became acquainted with the Smith patent truss, invented by Robert W. Smith of Tippecanoe, Ohio, in 1867. Miller moved to California in 1873, bringing with him an exclusive regional franchise to use the Smith truss. Shortly after, he came to Oregon where his first contract resulted in the Clackamas River bridge near Oregon City, a 215 foot Smith trussed span. After another brief interlude in California, he returned to Oregon and established the first large-scale bridge building business in the state. With the Clackamas River bridge, Miller's reputation as a competent bridge builder was assured. Miller's daring Smith trussed covered bridges were the pride of Willamette Valley residents, and did much to promote economic growth by enabling the farmer to bring surplus farm products to town without the inconvenience and expense imposed upon him by the ever present ferryman. A. S. Miller and his two sons Henry B. and Frank J., took bridge building from the local carpenters, and made of it a profitable business and with their consequent volume, raised bridge building standards at a time when standards were low at best.

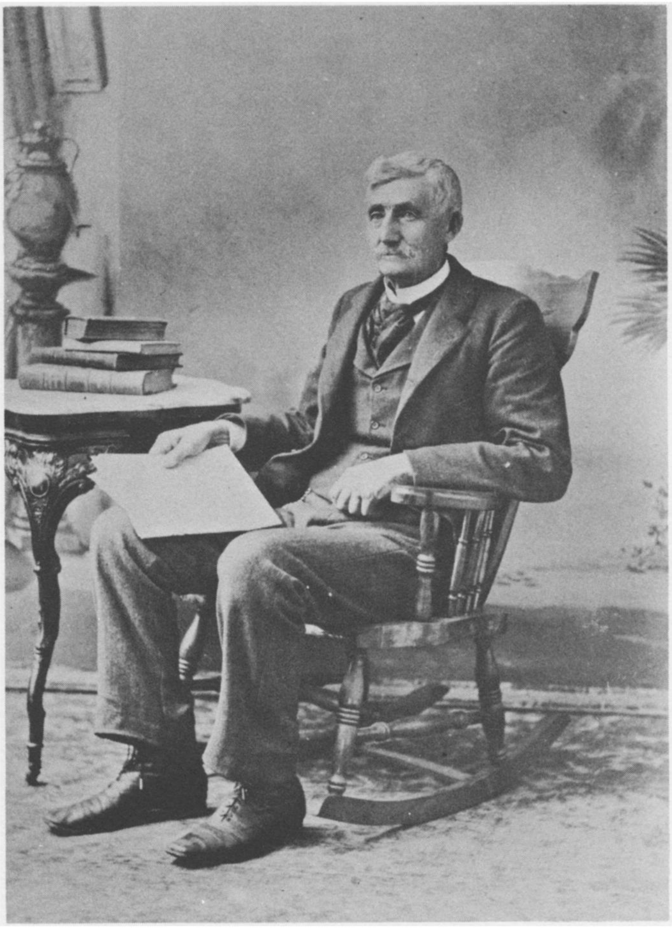
At various times they maintained offices in Eugene and Albany, but their success was amply demonstrated when they moved into Portland's commercial palace, the Union Block. The firm's total output never matched that of their young protege and later competitor, Lord Nelson Roney, but their list of 200 foot plus Smith trusses is impressive. The last major undertaking of the firm was a contract for building nearly all of the bridges and trestles for the extension of the Oregon and California Railroad from Roseburg to Ashland in 1881-83.

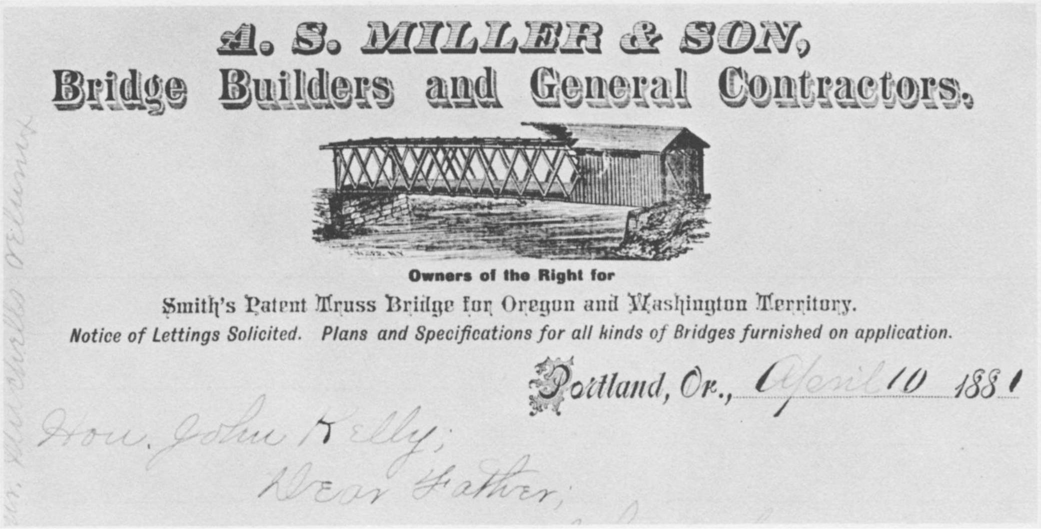
The firm's letterhead was unique for its cutaway drawing of the Smith Patent Truss Bridge, which Miller so successfully built. Though he retained exclusive territorial rights to the design, many Smith type trusses were built by bridge pirates, anxious to benefit from the trusses' popularity, without paying the royalty.

The rocking chair portrait of A. S. Miller was taken in 1896 by Crawford and Paxson, Albany photographers. He died in Albany at the age of eighty-eight.

Letterhead: *University of Oregon Library*

Portrait: *Courtesy Kenneth C. Miller*





A. S. MILLER & SON,

Bridge Builders and General Contractors.

Owners of the Right for

Smith's Patent Truss Bridge for Oregon and Washington Territory.

Notice of Lettings Solicited. Plans and Specifications for all kinds of Bridges furnished on application.

Portland, Or., April 10 1881

Hon. John Kelly;

Dear Father;

r. Wm Charles Ellinor

LORD NELSON (NELS) RONEY 1853-1944

Oregon's greatest covered bridge builder was born in Ohio, one of twelve children. The family moved to Missouri where his father engaged in farming. With Nels' services needed on the farm, his education was necessarily limited, but by the age of nineteen, he was able to leave the farm and serve an apprenticeship in the practical trade of carpentry.

In 1876 he came to Oregon, where his first job as a bridge carpenter was with A. S. Miller on the Eugene bridge. His next job with Miller, the Santiam River bridge at Jefferson, ended in near catastrophe when the falsework collapsed with ten men on the unfinished trusses. Nels was so severely injured that he must have had some second thoughts regarding bridge building, for he temporarily abandoned that trade for house carpentry. Later he rejoined Miller's crew as bridge foreman, a position which he kept until the 1881 flood. The flood took out more bridges than the available contractors could replace, so Nels left the firm and submitted the low bid, $1,700, for the McKenzie Toll Bridge, thus launching himself into a remarkable career of building which spanned forty years of work in Oregon and California. During that period, he erected over a hundred covered bridges, as well as an impressive list of public, commercial, and religious edifices in the Willamette Valley. He built nearly every important building in Eugene from 1886 to 1905. Roney so thoroughly understood the bridge building business that he was able consistently to underbid his competitors with such uncanny regularity that for forty years few Lane County covered bridges were ever built that did not bear the sign, "L. N. Roney, Builder." He died at the age of ninety-one and is buried in the Masonic Cemetery in Eugene.

Photo: *University of Oregon Library*

WORTHINGTON BRIDGE
SOUTH UMPQUA RIVER
DOUGLAS COUNTY, 5 MILES NORTHEAST OF CANYONVILLE
T30S-R4W-S7
BUILT: CA. 1910 BY: ALPHEUS FIELDS, ROSEBURG CONTRACTOR
MAIN SPAN: SMITH PATENT, LENGTH NOT KNOWN

This structure, now standing only in skeletal form, carries the Worthington family name, whose ranch was served by the bridge.

Unfortunately, the housing, roof, floor, and approaches were removed about 1951, for use as salvage lumber, and the trusses left standing, useless even as a foot bridge, to rot in the elements. However, its present condition reveals the peculiar assembly of the now rare Smith truss, a one-time popular structural bridge system in Oregon. Unlike most Smith trusses, supplementary tension rods were never added to this span, but like most Oregon covered bridges, it is a twentieth-century modern rarity, serving but 40 years. Situated between the historic community of Canyonville and Days Creek, the bridge enjoys a scenic backdrop.

Photo: *By author*

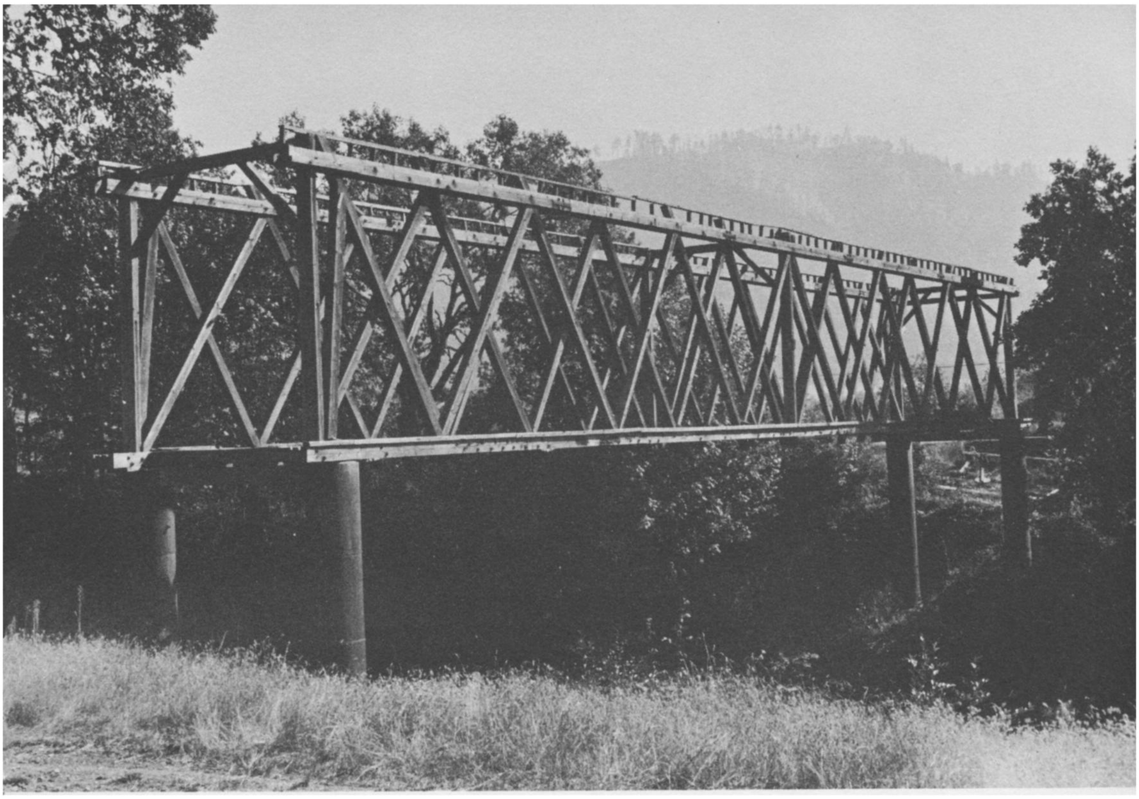
PATENT DRAWING FOR SMITH TRUSS

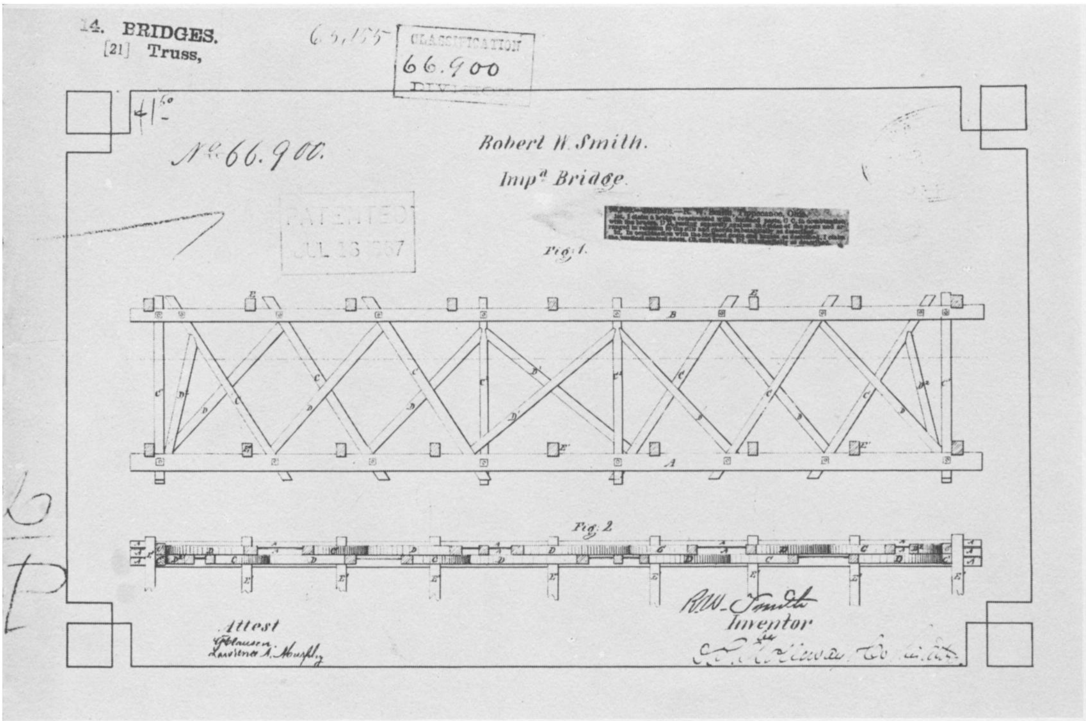
The mid-nineteenth century dilettante engineer frequently dabbled in designing variations on the then standard truss types, and patent office records bulged with strange truss designs. A letters patent only required the inventor to prove that he had developed a "new and useful Improvement in Bridges." While they may have been "new," they were seldom "useful." Robert W. Smith, of Tippecanoe, Ohio, was more fortunate. His truss design, patent No. 66,900, dated July 16, 1867, though lacking in structural refinements, claimed certain advantages such as:

> its strength, owing to the equal distribution of the load; its staunchness following from the mode of bracing; and its lightness and cheapness. All iron supporting and brace-rods, and also the cast-iron triangular foot-pieces in common use, are dispensed with.

Exclusive regional franchises were hawked as far west as California and Oregon, by eager agents equipped with scale models. Its chief proponent in Oregon was A. S. Miller and Sons. Nearly every important Oregon covered bridge of the mid 1870s was a 230 foot Smith-franchised, Miller-built structure. Establishment of local iron works changed the picture so that by 1885, nearly all Oregon bridges were either wooden Howe trusses with iron tension rods, or combination wood and iron Pratt trusses. After 1900, the Smith patent truss enjoyed a brief, but illegitimate revival in southern Oregon.

Photo: *National Archives, Patent Office Records*





14. BRIDGES.
[21] Truss,

65,155

CLASSIFICATION
66.900
DIVISION

41.60

No. 66.900.

Robert W. Smith.
Impd Bridge.

PATENTED
JUL 16 1867

Attest
G. Clausen
Lawrence A. Murphy

R.W. Smith
Inventor

LOOKINGGLASS CREEK BRIDGE

LOOKINGGLASS CREEK
DOUGLAS COUNTY, ½ MILE EAST OF BROCKWAY
T28S-R6W-S20
BUILT: 1922 BY: DOUGLAS COUNTY AND STATE OF OREGON
MAIN SPAN: 105 FOOT HOWE TRUSS, COST ABOUT $8,000

Three bridges of this design and span were built on the Winston-Camas Hill section of the then new Coos Bay-Roseburg highway. Work was begun December, 1921 and finished in November, 1922 by J. W. and J. R. Hillstrom, Marshfield contractors. The cost was shared between Douglas County and the State of Oregon, with the plans furnished by the Highway Commission. The entire structure, including the portal design, was standard in 1922 and featured whitewashed interior, generous window openings, and a laminated floor. Lookingglass Creek at this point is just a few hundred feet from its confluence with South Umpqua River. Like many of its neighboring Douglas County spans, this structure has been replaced with a modern bridge.

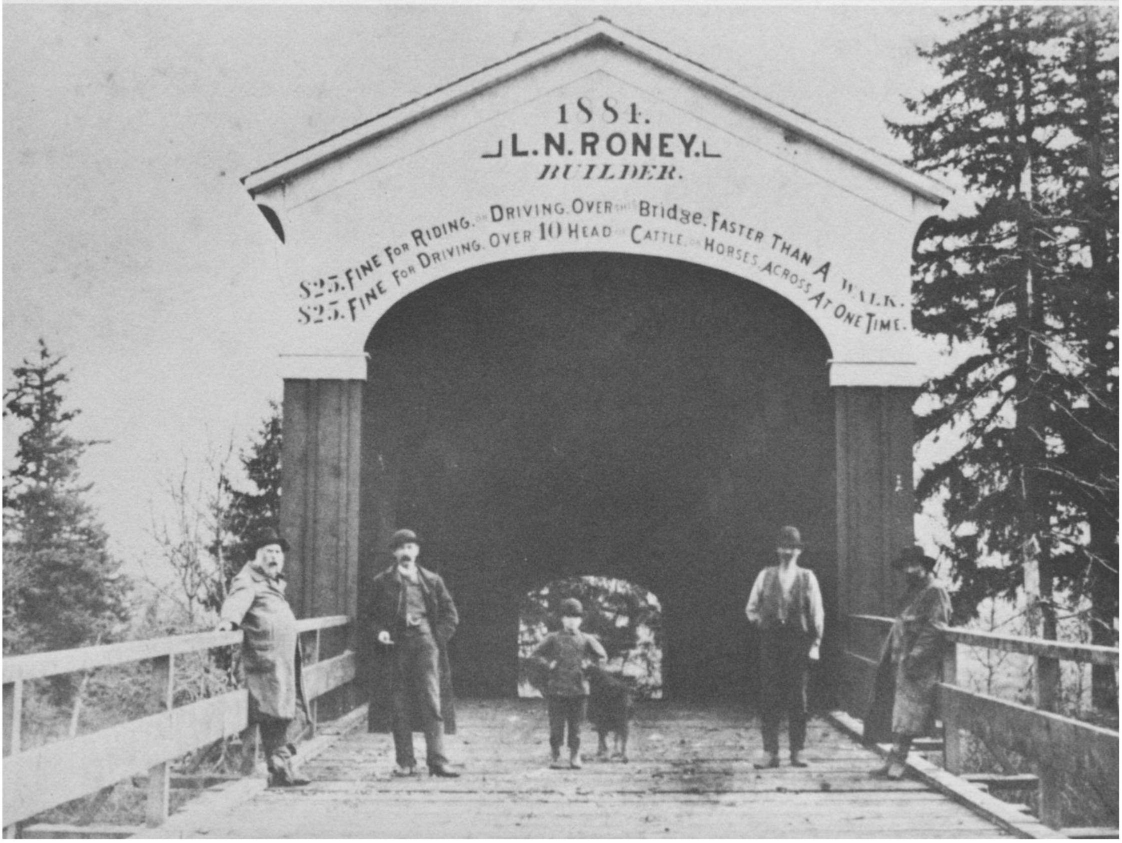
Photo: *University of Oregon Library*

CRESWELL BRIDGE

COAST FORK WILLAMETTE RIVER
LANE COUNTY, 1½ MILES SOUTHEAST OF CRESWELL
T19S-R3W-S24
BUILT: 1884 BY: L. N. RONEY, CONTRACTOR,
FOR LANE COUNTY
MAIN SPAN: 140 FOOT 12 PANEL HOWE TRUSS, SPLICED
CHORDS, RESTING ON WOOD-CRIB PIERS

To look after the county's interests in bridge matters, the commissioners often appointed a local resident, paying him a fixed fee to handle bid letting and supervision of construction. For the Creswell Bridge, the commissioners appointed none other than John Whiteaker. Whiteaker had been Oregon's first governor after statehood (1859-1862), and was retired on his farm near Creswell. On August 1, 1884, Whiteaker opened the bids and let the contract by public outcry at the courthouse to Lord Nelson Roney, Oregon's most prolific covered bridge builder. His bid was $3,900. Material for the bridge was furnished by the sawmill at Huckleberry Flat, and work was completed by the end of November, 1884. The structure was removed about 1931, after a life of forty-seven years. The photo, taken shortly after completion, shows Gov. Whiteaker (at left), with Roney, already famous for his bridge building feats, standing next to him.

Photo: *University of Oregon Library*


1884.
L.N. RONEY.
BUILDER.
$25. FINE FOR RIDING OR DRIVING OVER THIS Bridge FASTER THAN A WALK.
$25. FINE FOR DRIVING OVER 10 HEAD OF CATTLE OR HORSES ACROSS AT ONE TIME.

LOWELL BRIDGE (ORIGINALLY KNOWN AS THE HYLAND FERRY BRIDGE)

MIDDLE FORK WILLAMETTE RIVER
LANE COUNTY, AT LOWELL
T19S-R1W-S23
BUILT: 1907 BY: L. N. RONEY FOR LANE COUNTY
MAIN SPAN: 210 FOOT HOWE TRUSS, COST $6,295

Amos D. Hyland came from Lowell, Maine, in the 1850s and established this community. In addition to having fourteen children, he was postmaster, and later operated a ferry across the Willamette at that place.

In 1907, Nels Roney built the first bridge at this site to replace the old Hyland Ferry, the reason being that "the cost of keeping men employed as ferrymen . . . is much more than the interest on the money that will be expended on the building of bridges and there are many times in the year when the ferries are impracticable to operate on account of high water." That summer during construction of the Lowell bridge, a Eugene paper commented on another great labor-saving device, the eight-hour day, "The boys like the eight-hour day, which is now the law for all county work, roads and bridges, first rate. It gave them ample time to go fishing these long days or enjoy an outing generally. They worked all the harder while they were at work."

In October, Nels' wife, Orilla, made a visit to the Lowell bridge construction, where they were photographed together while the crew was putting the finishing touches on the bridge. The proud crew lined up as the event was recorded, with Nels, age fifty-four, standing at the right. Following this, Mrs. Roney left to "rusticate" in the mountains. Nels made his usual post-bridge fishing trip back to Eugene; Mrs. Roney returned by stage.

Roney's structure was replaced with a shorter, but similar span, and the surrounding environment has been completely transformed by the Army Engineers.

Photo: *University of Oregon Library*

SPRINGFIELD STREETCAR BRIDGE
WILLAMETTE RIVER
LANE COUNTY, AT SPRINGFIELD
T17S-R3W-S35
BUILT: 1910 BY: L. N. RONEY FOR P. E. AND E. RAILWAY
MAIN SPAN: THREE 200 FOOT HOWE TRUSSES, ON CONCRETE PIERS, COST ABOUT $30,000.

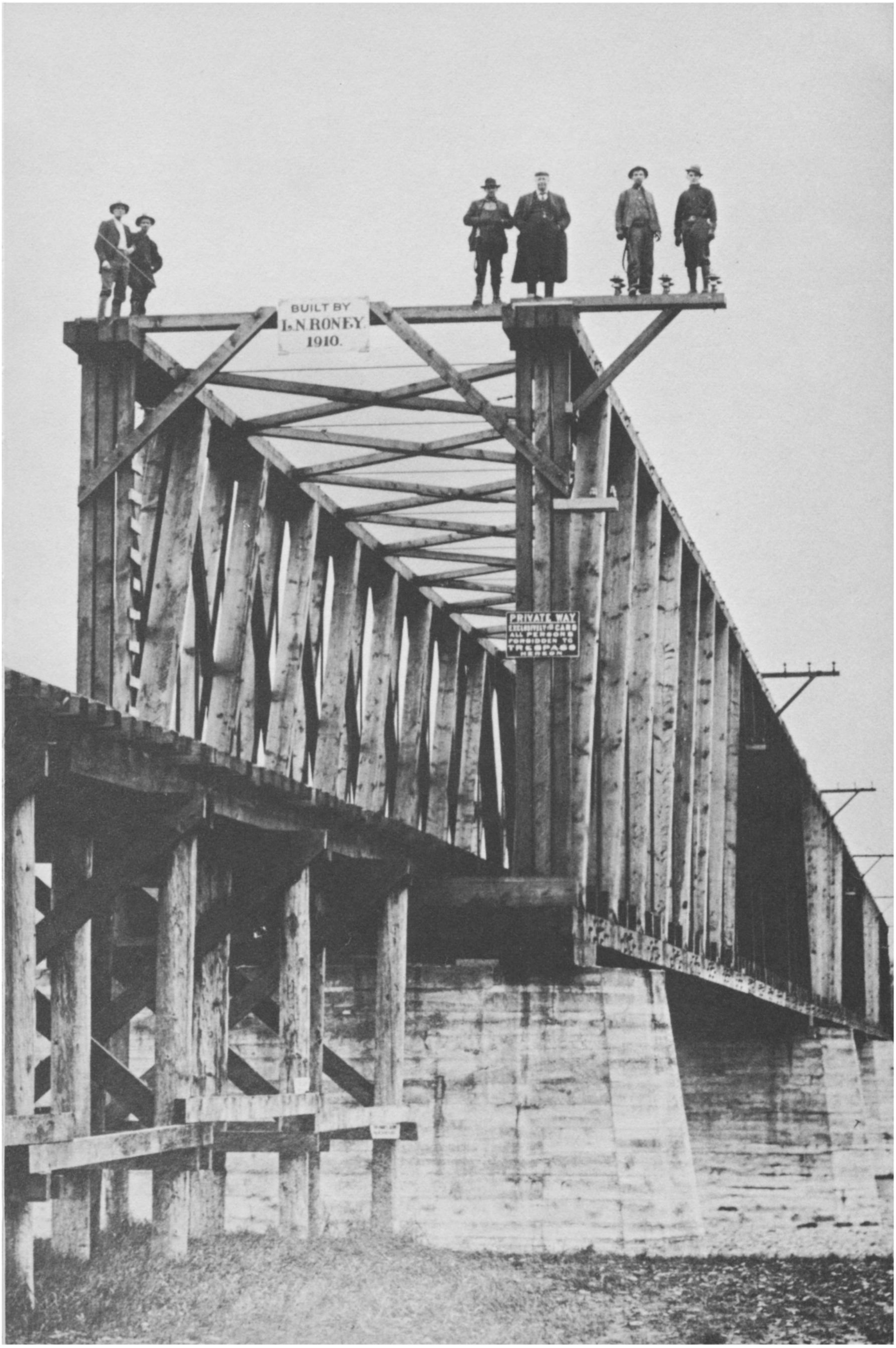
1910 was a year of superlatives in Eugene. Local papers were loquacious concerning the latest boon to progress—the streetcar, and the streetcar bridge which would establish a modern transportation facility between Eugene and Springfield. To span the Willamette the owners and builder planned a 600 foot bridge to be housed and roofed, but the vagaries of its speculative and promotional background conspired against such an additional expense, and the bridge was doomed to a short-lived but well-remembered existence. The Portland, Eugene and Eastern Railway was expanding its operations down the Willamette Valley and this bridge was to link Eugene and Springfield, thus providing a new terminus for the line. Chief promotor for the project was Alvadore (Al) Welch, but unfortunately many of his speculative ventures existed only in platted "paper" cities or died of unwarranted optimism. However, the Springfield streetcar bridge materialized in short order. A boldly conceived and well built structure, it was the object of considerable local and editorial pride. Designed by Eugene architect J. R. Ford, the bridge was built by Lord Nelson Roney and his efficient bridge crew in 120 working days. On October 6, 1910, the *Eugene Morning Register* announced the near completion of Roney's "latest masterpiece":

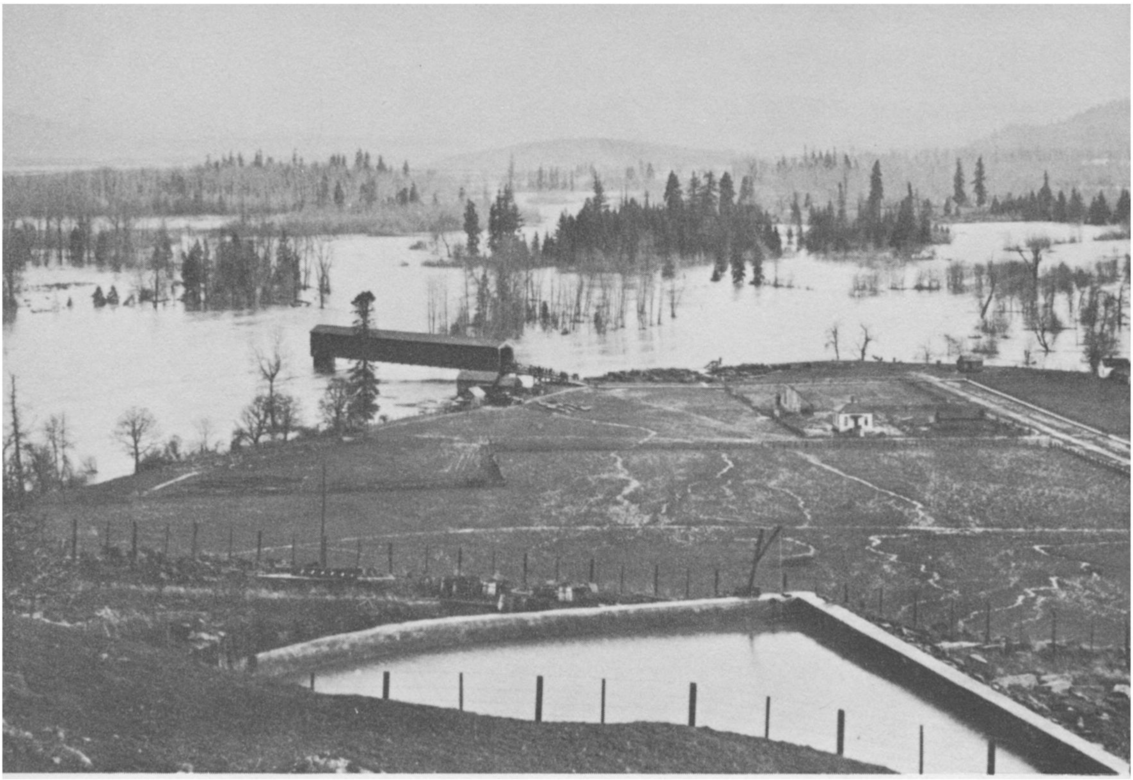
> The big structure is a model of architectural neatness as it is as straight as a die from one end to the other and reflects great credit on Lane county's greatest and best bridge builder. He . . . says it is a pity to leave it uncovered, as it will last three times as long in this wet climate if it were protected from the rains. The company contemplates putting on a roof and cover in a year or two.

Later that month, with the crossing of the first "interurban" car, the *Register* headlined the event, "New Era In Valley," and "Two Cities Clasp Hands Over New Bridge." During the ceremony, the president of the Springfield Commercial Club called upon contractor Roney that he might acknowledge the public's acclaim, but the "modest Mr. Roney withdrew and hid himself."

During the following years the bridge played an important role in that bogus solution to the liquor problem—local option. With Eugene "dry" and Springfield "wet," the bridge carried many a streetcar loaded with habitues of Springfield saloons. The 'New Era in the Valley' was as short-lived as it was optimistic and the bridge ceased to do service in the mid 1920s.

Photo: *University of Oregon Library*


BUILT BY
L.N.RONEY.
1910.
PRIVATE WAY
EXCLUSIVELY FOR CARS
ALL PERSONS
FORBIDDEN TO
TRESPASS
HEREON



EUGENE BRIDGE (FERRY STREET BRIDGE)
WILLAMETTE RIVER
LANE COUNTY, AT EUGENE

T17S-R3W-S29

BUILT 1876 BY: A. S. MILLER AND SONS, FOR LANE COUNTY

MAIN SPAN: 230 FOOT SMITH TRUSS, COST $10,200

When A. S. Miller, in 1874, entered the Willamette Valley armed with an exclusive franchise on the Smith patent truss, he must have brought a goodly amount of persuasion with him, for it was not long before the county courts specified that patented truss for the most important new spans. Such was the case with Lane County, so that letting of a contract became mere formality. However, following court procedure, the contract for the Eugene bridge was let by public outcry at the courthouse door on Saturday, July 10, 1875. A. S. Miller had the job in his pocket for the then substantial sum of $10,200. Collecting his fortune would be another matter for the county put up only half that sum, the balance to be raised by public subscription, a task of bushbeating often left to the bridge builder himself or his agents.

Work did not commence until May, 1876, but was handily finished for the harvesting season that fall. Miller's efficiency in erecting the rather daring 230 foot span never ceased to provoke editorial comment, and when it was opened for traffic, the *Oregon State Journal* pronounced that

> The structure is highly creditable to the contractors, A. S. Miller & Son, and prove [*sic*] conclusively that they are men of experience and understand their business thoroughly.

The January 1881 flood, disastrous to many bridges in the valley, did but little damage to the Eugene span. Drifting trees carried away the northern approach and a slight shift in the channel at that end forced the addition of a short span to bridge the widened channel. Miller took the contract for $1,249. The bridge, now lengthened, only added to the reputation of Miller, for the Eugene citizenry were proud that their bridge had refused to give way to a flood which had crested twenty-two feet above low water level.

The February 1890 flood was even more remarkable as a nemesis of bridges. Nearly every large bridge in the valley was taken out, and many a bridge floating down river succeeded in taking others with it. The Eugene bridge held, but the newly added short span and the north approach were carried away, leaving only the main span. Fortunately the short span went out during the night, otherwise the loss would have been compounded since the bridge had been crowded with flood watchers daily eyeing the river which finally rose to the twenty-four foot level. Roney won the job for rebuilding the short span and approaches. His bid for the 120 foot Howe truss extension, including 180 feet of pile approaches, totaled $2,850, and the extant specifications for this job reveal his attention to sound construction and quality materials. Roney's addition to the old bridge actually made it into a two span affair totaling 350 feet in length. Bridge users must have been confused for upon entering the south span they were confronted with the "Built by A. S. Miller" sign, while the boldly lettered "Built by L. N. Roney" appeared on the opposite end of the bridge.

The flood photo was taken February 4, 1890, a day after the north approach and short span washed away. This view recorded from Skinner's Butte, just below the University of Oregon Observatory (built four years earlier), dramatically reveals a flood so extensive that the river channel is completely obscured. A number of flood watchers can be seen lined up against the railings of the south approach.

Despite the somewhat irrational Smith patent truss and two devastating floods, the Eugene bridge (later called the Ferry Street Bridge) lived up to the brag for thirty-seven years before it was replaced with a steel span. The steel span served no longer than its wooden predecessor before it too became obsolete, and was replaced with a wider steel span.

Photo: *University of Oregon Library*

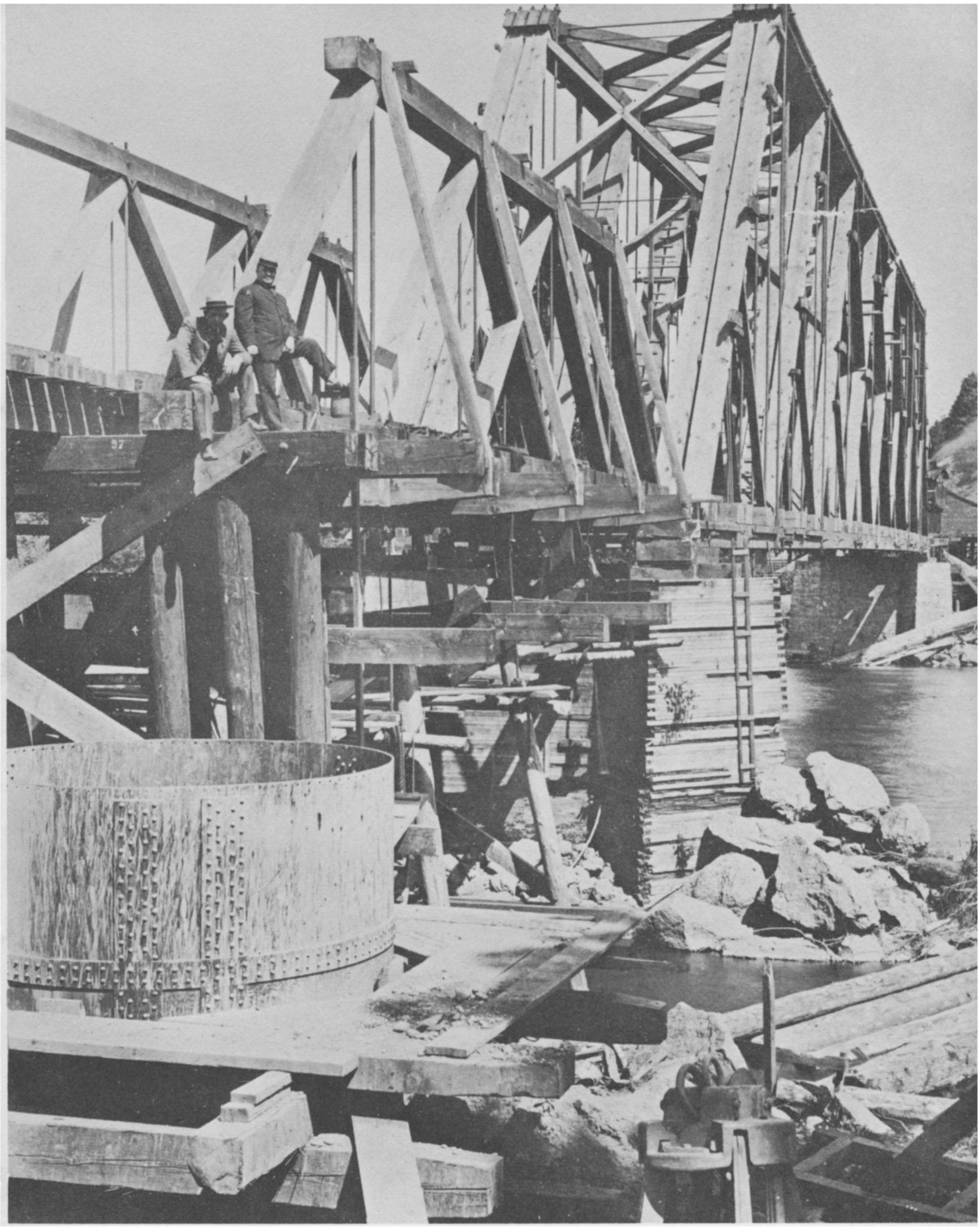
COBURG RAILROAD BRIDGE
MCKENZIE RIVER
LANE COUNTY, 2 MILES SOUTH OF COBURG
T17S-R3W-S9
BUILT: 1891 BY: SOUTHERN PACIFIC COMPANY
MAIN SPAN: 260 FOOT HOWE TRUSS

Among Oregon covered bridges, this was one of the longest single spans ever built in the state. Its claims have been exaggerated, however, and reliable sources have erroneously listed it as the longest existing timber truss in the world. It was not built in 1926 as often stated. In fact it was replaced with a steel span in 1907. Its main span was not 380 feet, but rather 260 feet. Only by adding the 60 foot pony trusses at each end could one arrive at the former figure.

The Coburg Railroad Bridge served only sixteen years, for in 1907 it was replaced with a 400 foot pin-connected steel span, originally fabricated in 1887 and erected over the John Day River for the OWR&N Company.

The photograph shows the old timber bridge just prior to its 1907 replacement. The roof and siding had been removed, and steel caissons in the foreground are being prepared for the stronger steel span, designed to carry heavier rolling stock.

Photo: *Courtesy Oregon Historical Society*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"THE COVERED BRIDGE"
BRIDGE CREEK
WHEELER COUNTY, 4 MILES NORTHWEST OF MITCHELL T11S-R21E-S21
BUILT: 1917-18 BY: WHEELER COUNTY AND STATE OF OREGON
MAIN SPAN: 90 FOOT HOWE TRUSS

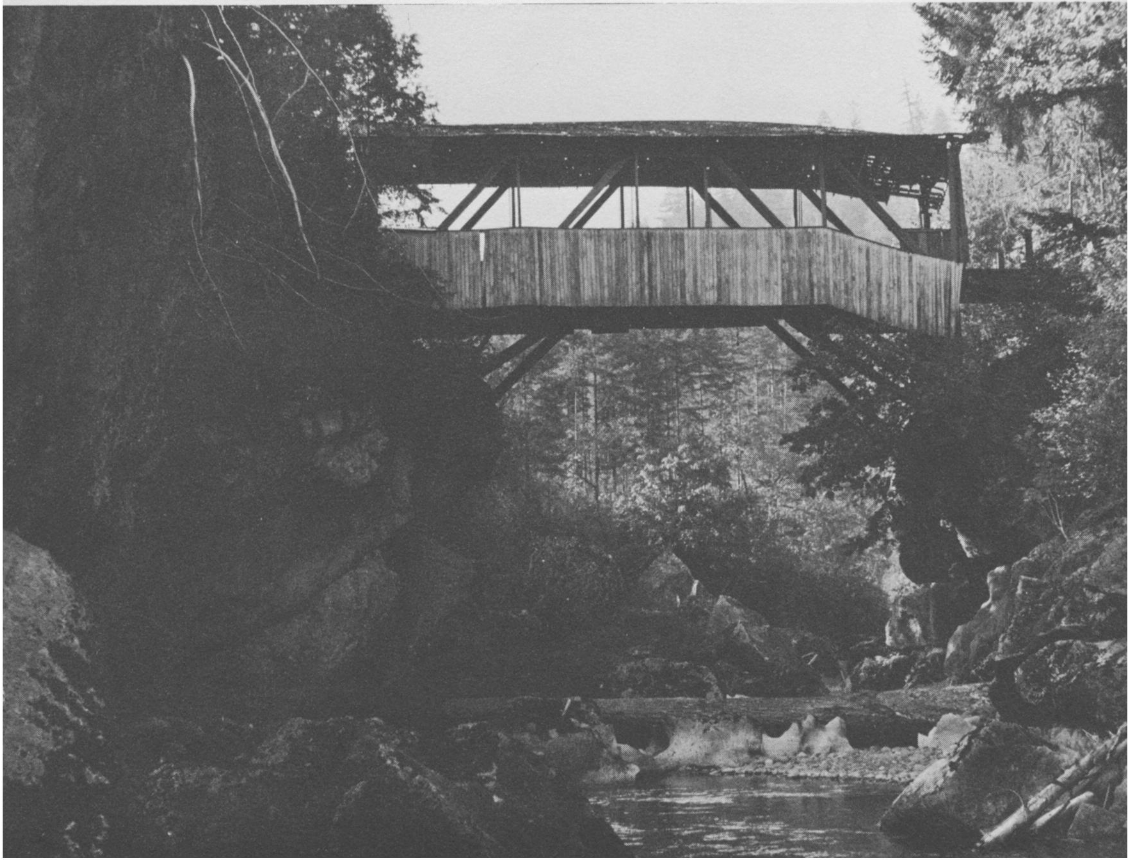
Wheeler County in 1917 was without rail or water transportation and its dependency on automobile travel forced a program to improve road facilities. At that time there were only 243 vehicles registered in the county with no paved roads in the 1,700 square mile area. The necessity for housing a wooden truss in the dry climate of eastern Oregon is dubious to say the least and a good illustration of the "covering" habit carried to extremes. When the standards of eastern Oregon highways were finally raised, covered bridges were replaced with narrow concrete or steel structures which were obsolete almost from their inception. The bridge was erected by the United Contracting Co. at a cost of $6,774.16 for the joint use of the state and county. After a useful life of thirty-five years serving the traffic between Mitchell and Prineville, the bridge was replaced in 1952 with a concrete skew span. At the time of demolition the structure enjoyed the highest and driest site of any covered bridge on a state highway. The altitude at this crossing is about 2,370 feet above sea level. A mile northwest of the bridge site is Sargent Butte seen rising behind the bridge, and to the left is Sand Mountain (3,850 feet), known as a deer hunting locale.

Photo: *Courtesy Oregon State Highway Commission*

CANYON CREEK RANCH PRIVATE BRIDGE
SOUTH SANTIAM RIVER
LINN COUNTY, 1 ½ MILES EAST OF CASCADIA T13S-R3E-S33
BUILT: CA. 1925 BY: GALE S. HILL
MAIN SPAN: APPROX. 75 FOOT MODIFIED QUEENPOST

Probably no other Oregon covered bridge appears to grow, rootlike, out of its site quite so well as this private span over the water-sculptured gorge of the South Santiam, just below the Canyon Creek outlet. Gale S. Hill, once district attorney and later circuit judge for Linn County, resided in Albany and kept a mountain "ranch" for a botanical garden and retreat. Hill had the bridge built to serve his ranch, supposedly by county forces, and title to it later passed into his hands. Today it is a private span still used by subsequent owners. True or not, the trusses exhibit structural peculiarities exhibited on several other Linn County covered bridges of the period, particularly the lack of diagonal truss members in the center panel point, thus introducing such sag that the bridge is now supported from below. Whatever its technical deficiencies, the Canyon Creek Ranch bridge is the quintescence of romantic delapidation, and as such seems to span the moat-like Santiam defile which once separated the mountain botanical paradise from the highway and ultimately from the less sensitive aspects of city life.

Photo: *By author*



GOODPASTURE BRIDGE

MCKENZIE RIVER

LANE COUNTY, 1 MILE WEST OF VIDA
T16S-R2E-S29

BUILT: 1937-39 BY: LANE COUNTY

MAIN SPAN: 165 FOOT 11 PANEL HOWE TRUSS

Designed by the Oregon State Highway Commission, this structure bears the unusual window arrangement intended by the engineers to furnish maximum lighting between panel points. The openings are cut off on an angle to accommodate truss diagonals. Such regular fenestration gives the bridge the impression of being occupied rather than serving as a vehicular tunnel.

Situated over a quiet spot of the otherwise famous white-water McKenzie River, the Goodpasture Bridge is a tourist favorite and one of the most photogenic bridges in the state.

Photo: *By author*

MAPLETON BRIDGE

SIUSLAW RIVER

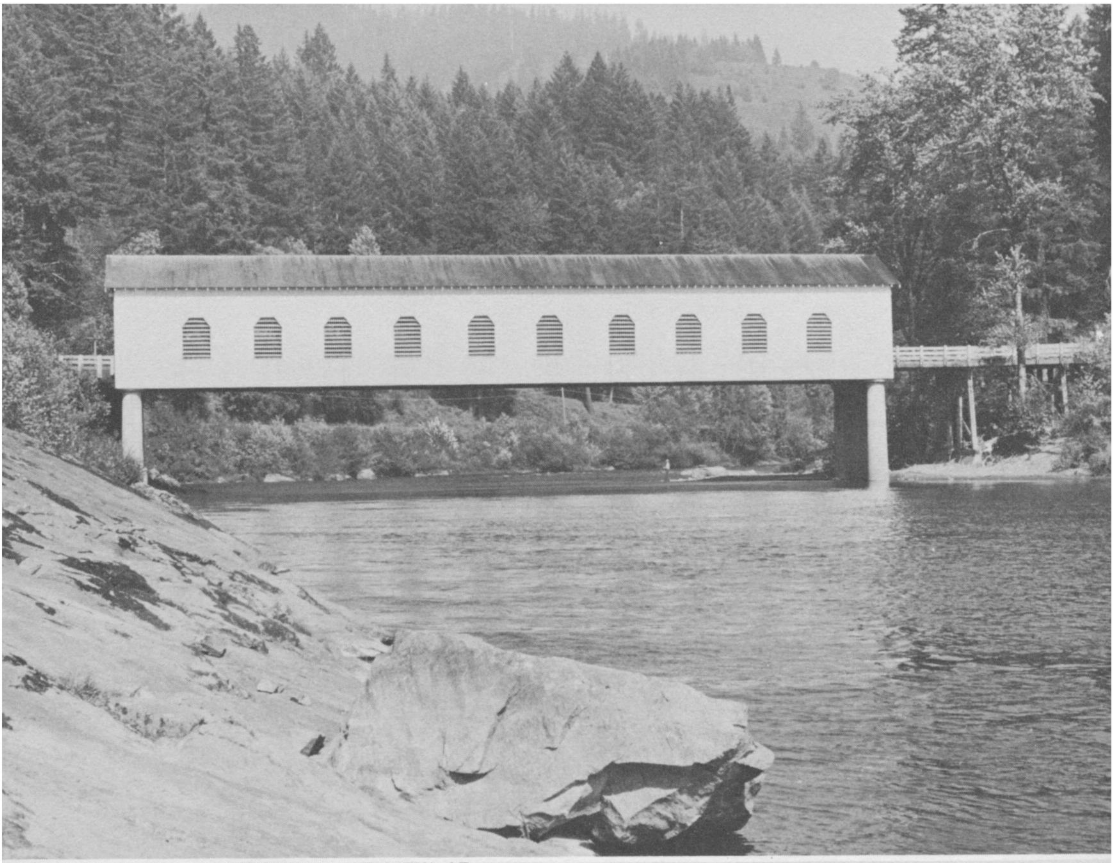
LANE COUNTY, AT MAPLETON
T18S-R10W-S2

BUILT: 1934 BY: LANE COUNTY AND THE C.C.C.

MAIN SPAN: TWO SPANS, EACH 114 FOOT 7 PANEL HOWE TRUSSES, AND ONE 35 FOOT DRAW SPAN, WITH APPROACHES, GIVING A TOTAL LENGTH OF NEARLY 650 FEET.

The winding path cut by the Siuslaw through narrow defiles, gives the town of Mapleton a unique geographic advantage of being located in the midst of Oregon's coast range of mountains and also within tidewater of the Pacific Ocean. The possibility of river navigation predicated the necessity of a draw span for the bridge at this point, but the draw has never been opened. To do so would require considerable notice, for water pipes would have to be disconnected and a derrick employed to lift the little span. In addition to the impressive setting, this bridge has lower chords which are among the longest one-piece sticks of Douglas fir ever employed for wooden bridges. These hewn chords measure 16″ x 16″ x 113′.

Photo: *By author*



WOODWORTH ROAD BRIDGE
EAST FORK HOOD RIVER
HOOD RIVER COUNTY, ¾ MILE WEST OF MT. HOOD POST OFFICE ON WOODWORTH ROAD
R10E-T1N-S28
BUILT: CA. 1920S REMOVED: 1957
MAIN SPAN: NOT KNOWN

Though the county lacks technical data concerning this bridge, the loss is not great, for it was the setting not the trusses that made the trip worth the effort. The approach to the bridge from Hood River on the Mount Hood Loop Highway was one of the most pleasant drives in Oregon. Leaving the Columbia River, less than 100 feet above sea level, the Loop Highway furnishes the driver with frequent vistas across the Hood River Valley, with the north face of Mt. Hood providing the visual climax to the scene. A pleasant fifteen mile drive brought one to Woodworth Road and the covered bridge which once crossed the icy waters of the East Fork Hood River. High water drift broke a truss, the bridge was abandoned, and the road relocated downstream with a new concrete span. The old bridge was then removed.

Though it was the last covered bridge on a Hood River County road, though the view embraced the rare prospect of 11,225 foot Mt. Hood only twelve miles distant, though the bridge itself was situated 1,400 feet above sea level and one of the few ever built north of the Willamette Base Line, this combination of factors apparently was not sufficient to save it for those who enjoy a rustic bridge in a spectacular setting. Such is the measure of progress.

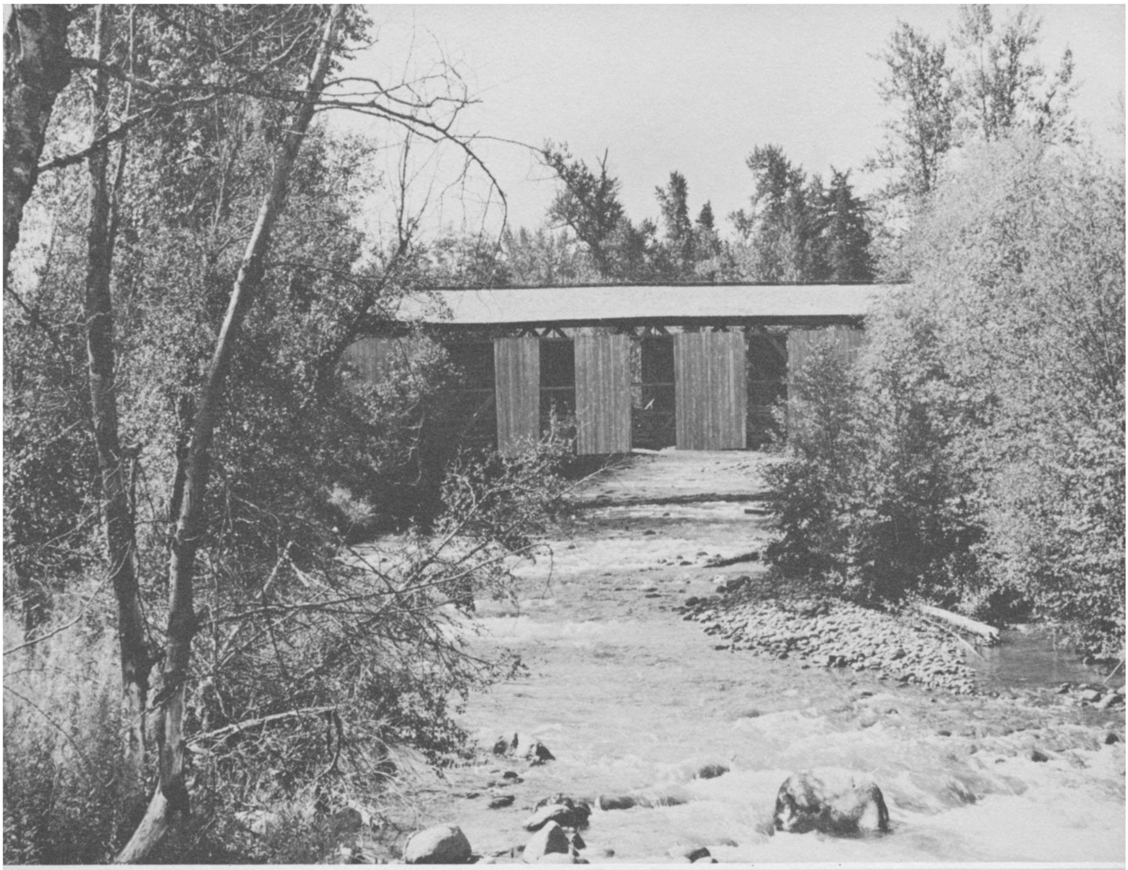
Photo: *By author*

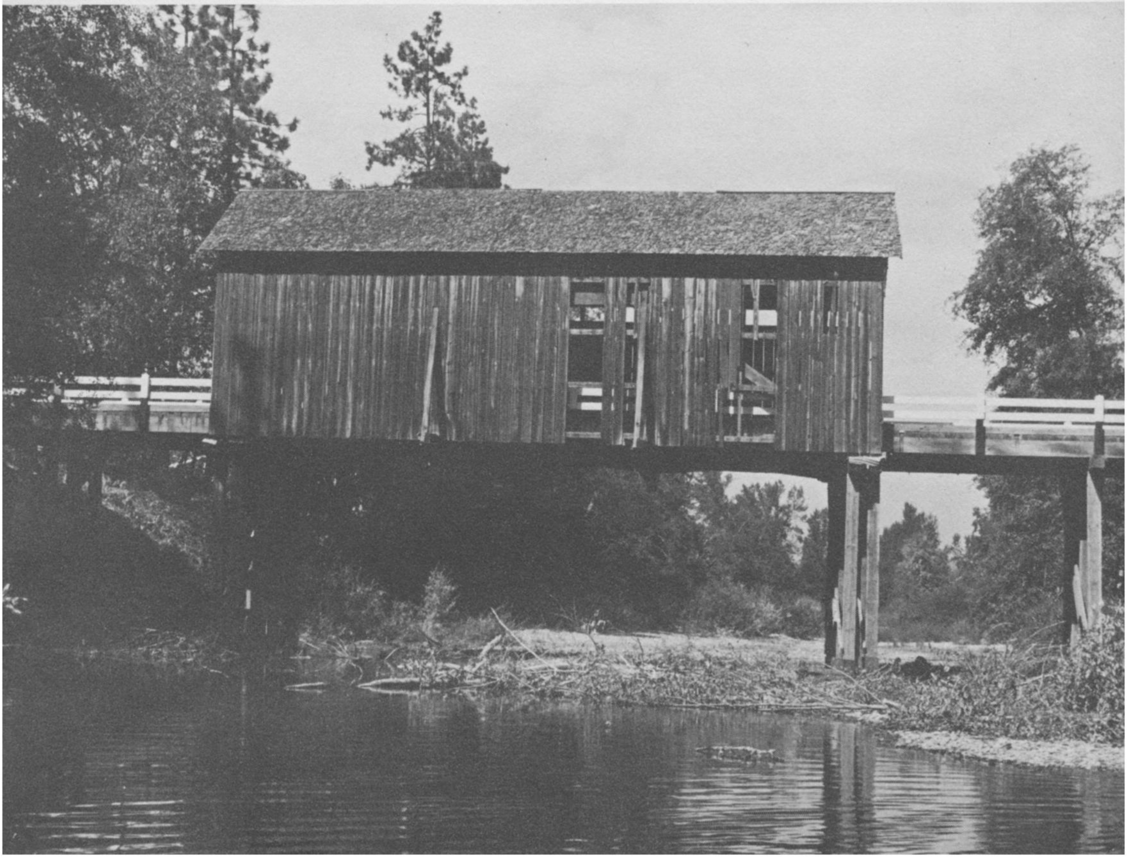
MINTHORN BRIDGE
EVANS CREEK
JACKSON COUNTY, 1¾ MILES SOUTHWEST OF WIMER
T35S-R4W-S21
BUILT: NOT KNOWN
MAIN SPAN: 57 FOOT QUEENPOST TRUSS

This bridge crosses Evans Creek in Pleasant Valley about six miles north from the town of Rogue River. Beyond Minthorn Bridge, and near the headwaters of the stream it crosses, was fought the Battle of Evans Creek, an important engagement in the Rogue River Indian wars. This battle, fought on August 24, 1853, has been memorialized topographically by Battle Creek, Battle Mountain and Little Battle Park.

The two most interesting and seldom seen Jackson County covered bridges are the Laurelhurst Bridge located in the Rogue River canyon about eight miles southwest of Prospect; and the McKee Bridge across the Applegate River about eight miles south of Ruch, less than ten miles from the California border. Both are difficult to photograph but a visit to each dramatically demonstrates the diversity of environment for Oregon covered bridges within a given county.

Photo: *By author*





TUALATIN RIVER BRIDGE
TUALATIN RIVER
WASHINGTON COUNTY, 3 MILES SOUTH OF TIGARD
T2S-R1W-S15
BUILT: 1918 BY: STATE OF OREGON
MAIN SPAN: 144 FOOT 8 PANEL HOWE TRUSS

The steel shortage during World War I forced the improvement of wooden bridge design. Like other covered bridges built following that critical period, the Tualatin River Bridge was designed for heavy traffic, being eighteen feet wide to handle the growing needs of the West Side highway. The portal design lacked the architectural refinements applied to state bridges of the 1920s. But it did feature laminated wood flooring with an asphaltic wearing surface and windows at panel points to increase visibility and "add to the appearance of the structure." Despite the conservative structural design, this too was replaced without having served its intended life span.

Photo: *University of Oregon Library*

UMPQUA RIVER BRIDGE
SOUTH UMPQUA RIVER
DOUGLAS COUNTY, 2 MILES SOUTHEAST OF DILLARD
T29S-R6W-S3
BUILT: 1918 BY: STATE OF OREGON
MAIN SPAN: TWO 144 FOOT HOWE TRUSSES

Designed and paid for by the Oregon State Highway Commission, this bridge (and its three-span sister structure just north of Dillard) would have been built of steel but for the shortage of that material created by World War I. However, the bridge contained several innovations inimical to OSHC policy concerning wooden covered bridges. It was daylighted by a series of 4′ by 8′ openings located at panel points. State bridge engineers justified the large openings esthetically as follows:

> Open windows . . . light the spans and make a more artistic appearance, lack of light and unsightly appearance having been the chief objections to covered wooden bridges.

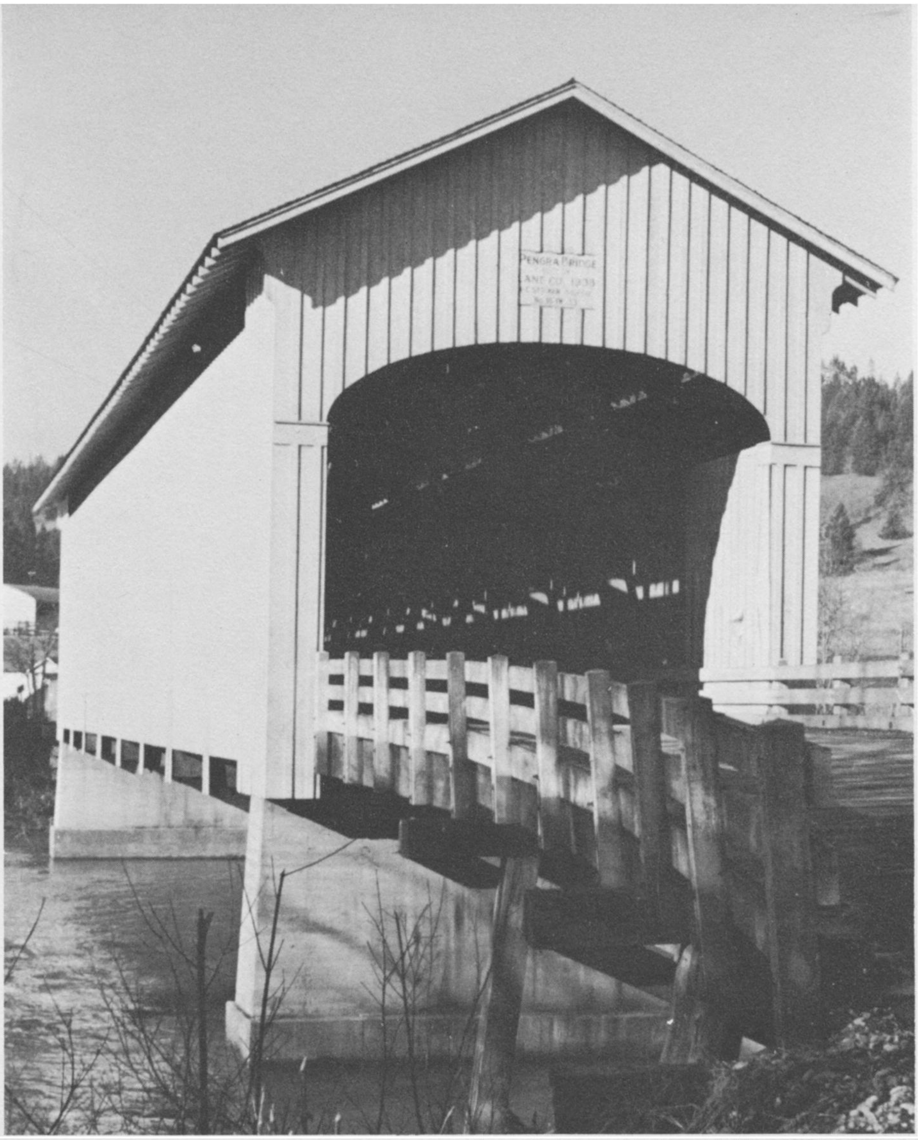
In the mid 1920s the individual windows were connected so as to make a continuous opening for increased visibility. The span also featured a laminated floor. Such first class construction cost the state only $21,277.88, contracted by the Portland Bridge Company. 1927 high water severely damaged the structure, but the depression delayed replacement until after the outbreak of World War II. The three-span sister bridge, nearly identical in appearance and built at the same time, crossed the Umpqua one mile north of Dillard. It boasted a roof 430 feet long, southern Oregon's longest. When finally replaced in 1950, it was the last remaining major covered bridge on the Pacific Highway.

Photo: *University of Oregon Library*

PENGRA BRIDGE
FALL CREEK
LANE COUNTY, 3½ MILES SOUTHEAST OF JASPER
T18S-R1W-S32
BUILT: 1938 BY: LANE COUNTY
MAIN SPAN: 120 FOOT 8 PANEL HOWE TRUSS

Two of the longest Douglas fir sticks ever hewn for an Oregon bridge were cut from Booth-Kelly timber holdings near Hendricks bridge, and moved by truck and trailer to the Pengra Bridge site near Jasper. The two sticks, 16″ x 18″ x 126 feet, comprised the lower chords of the Howe truss. The upper chords, while shorter of course, were of similar proportions, being 14″ x 18″ x 98 feet. While ring connectors and spliced chords enable the use of smaller members in a bridge truss, the overall cross section required is greater. One-piece chords simplified construction joints, but handling them was often difficult. Lane County bridges, all through the 1930s consistently used one-piece hewn chords, some of them reaching herculean proportions. Today, however, the selection, felling, hewing and transportation of such timbers introduces problems inconsistent with modern bridge construction methods.

Photo: *Chord photo courtesy Arthur C. Striker*
Bridge photo by author


PENGRA BRIDGE
LANE CO. 1938

THE BRIDGE AT BRIDGE
MIDDLE FORK COQUILLE RIVER
COOS COUNTY, 11 MILES EAST OF MYRTLE POINT
T29S-R11W-S33
BUILT: CA. 1936
MAIN SPAN: 150 FOOT HOWE TRUSS

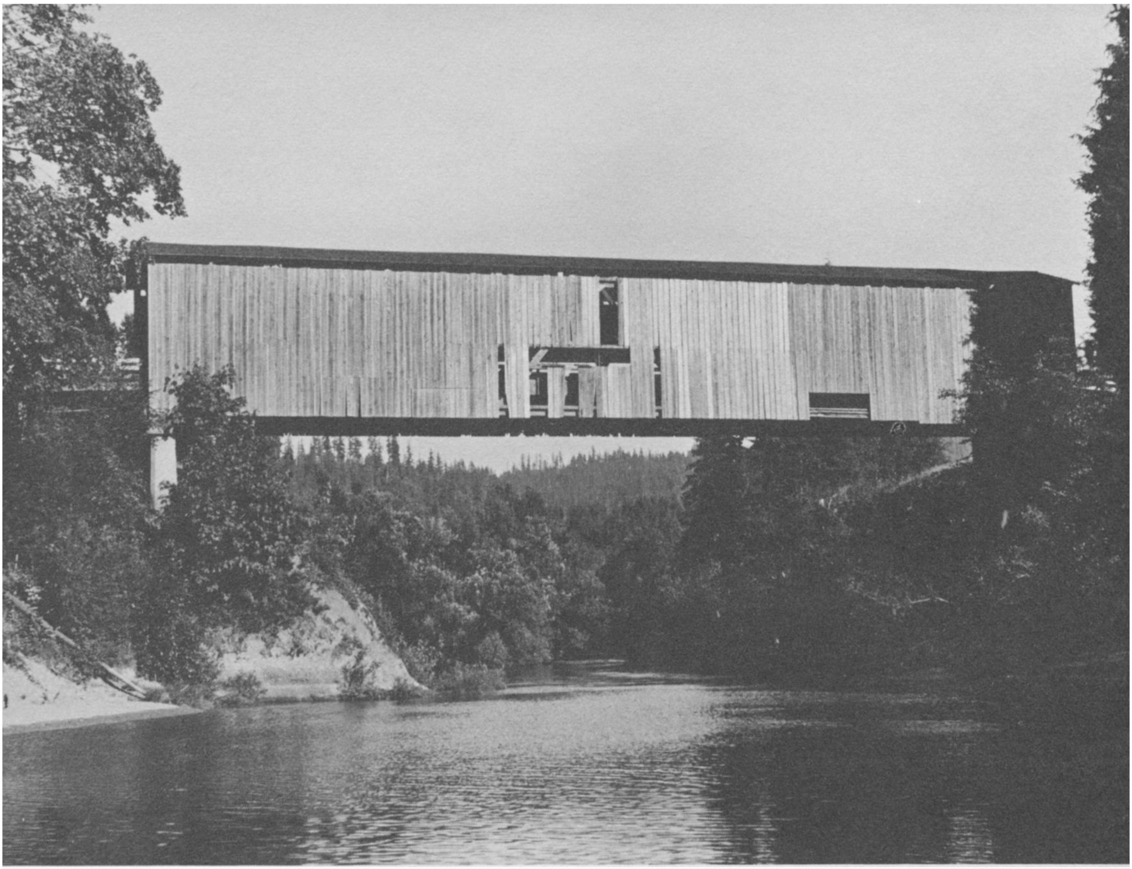
The covered bridges of Coos County, though lacking in structural interest, enjoy settings no less varied than that of the topography. Some of the earlier spans in the county utilized the Smith patent truss, but coastal bridges by virtue of their rugged environment, are short-lived and data concerning these bridges are insufficient to evaluate their technical novelty. The above bridge, located over the Middle Fork Coquille, replaces an earlier span, the existence of which apparently inspired the name of this community.

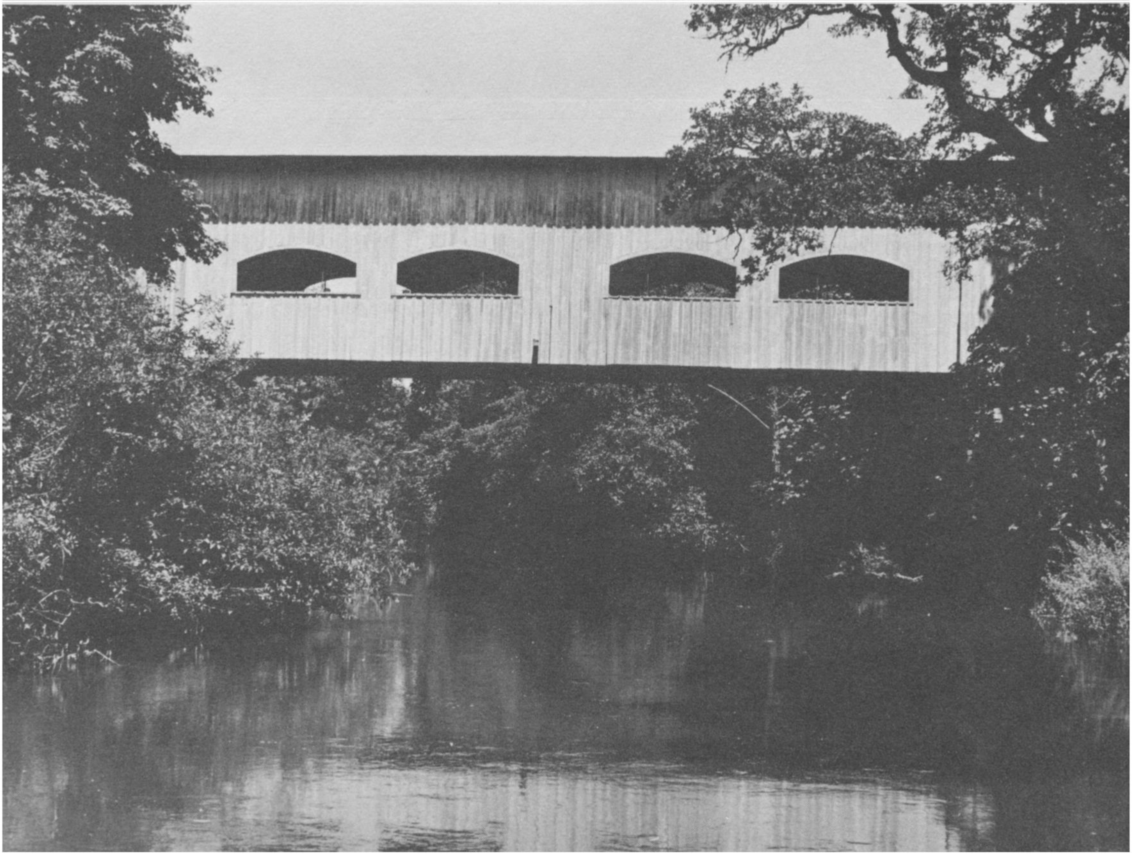
Photo: *By author*

ROCHESTER BRIDGE
CALAPOOYA CREEK
DOUGLAS COUNTY, 3 MILES WEST OF SUTHERLIN
T25S-R6W-S13
BUILT: 1933 BY: DOUGLAS COUNTY
MAIN SPAN: 80 FOOT HOWE TRUSS

The Calapooya Creek which descends from the Calapooya Mountains of Douglas County, should not be confused with the Calapooya River of Linn County. Both flow into important Oregon rivers, the Umpqua and the Willamette. Calapooya Creek joins the Umpqua River about six miles southwest of the Rochester Bridge. The eyebrow-type windows seem to peer out of this otherwise inarticulate box. This bridge replaces an earlier structure built about 1866, and the present design by Floyd C. Frear, long-time Douglas County engineer, is a good example of modern engineering applied to the ever-changing rural road needs.

Photo: *By author*





JOHN DAY RIVER BRIDGE

JOHN DAY RIVER
CLATSOP COUNTY, 4 MILES EAST OF ASTORIA
T8N-R9W-S24
BUILT: 1918 BY: PORTLAND BRIDGE COMPANY FOR THE STATE OF OREGON
MAIN SPAN: TWO 108 FOOT HOWE TRUSSES, WITH A 40 FOOT DRAW SPAN

Except for the scarcity and high price of steel during World War I, this structure would not have been one of the most unusual covered wooden bridges designed by the State Highway Commission. Making the best of the situation, the state bridge engineers attempted to overcome their principal prejudice against covered bridges, that is, the lack of light in closed spans. This they did by whitewashing the interior and by providing windows at panel points. This proved so effective that whitewashing and windows became standard procedure on other wooden bridges designed by the Highway Department.

The John Day at this point is navigable to small boats, hence the decision to provide a draw span of the single leaf bascule type operated by a windlass. Counterweights mounted on each side of a gothicized tower give the double span a most unique appearance. In order to compensate for the variable pull required to lift the span at different phases of its movement, the counterweight cables were wound over spiral drums so that "their pull is a maximum when the span is down, and is least when the span is raised, gradually changing between the two extremes." Automatic gates were installed to prevent some negligent motorist from plunging into the river during operation of the draw span. The bridge boasted asphalted laminated floors capable of carrying twenty ton trucks. Such capacity was not arrived at empirically, but rather by applying modern structural analysis to covered wooden bridge building techniques.

This rather unique double covered bridge with an uncovered draw span was probably the most northerly covered bridge ever built in the state. As with most first class wooden bridges on primary state roads, its cost was high, $25,000, and its life short, only fifteen years.

Photo: *University of Oregon Library*

LOWELL BRIDGE
MIDDLE FORK WILLAMETTE RIVER
LANE COUNTY, AT LOWELL

T19S-R1W-S14 and 23
BUILT: 1945 BY: LANE COUNTY
MAIN SPAN: 165 FOOT 11 PANEL HOWE TRUSS,
COST $25,473.17

The first covered bridge at this site was erected by L. N. Roney, in 1907, but the setting was much less anachronistic than pictured above. Upstream and beyond the present bridge is Lookout Point Dam, a recent flood control project. Located downstream is Dexter reregulating dam which backs up the Willamette to form Dexter reservoir. Construction of Dexter Dam necessitated raising the bridge seven feet to accommodate filling of the reservoir. In reporting this, the *Eugene Register Guard* announced that the bridge had been "razed," a typographical error. An alert reader, in a letter to the editor, set things right as follows:

> The reporter must surely be dazed,
> Who reported the Lowell bridge razed.
> Should he visit the scene
> It would surely be seen
> that the bridge was not razed
> But was r-a-i-s-e-d.

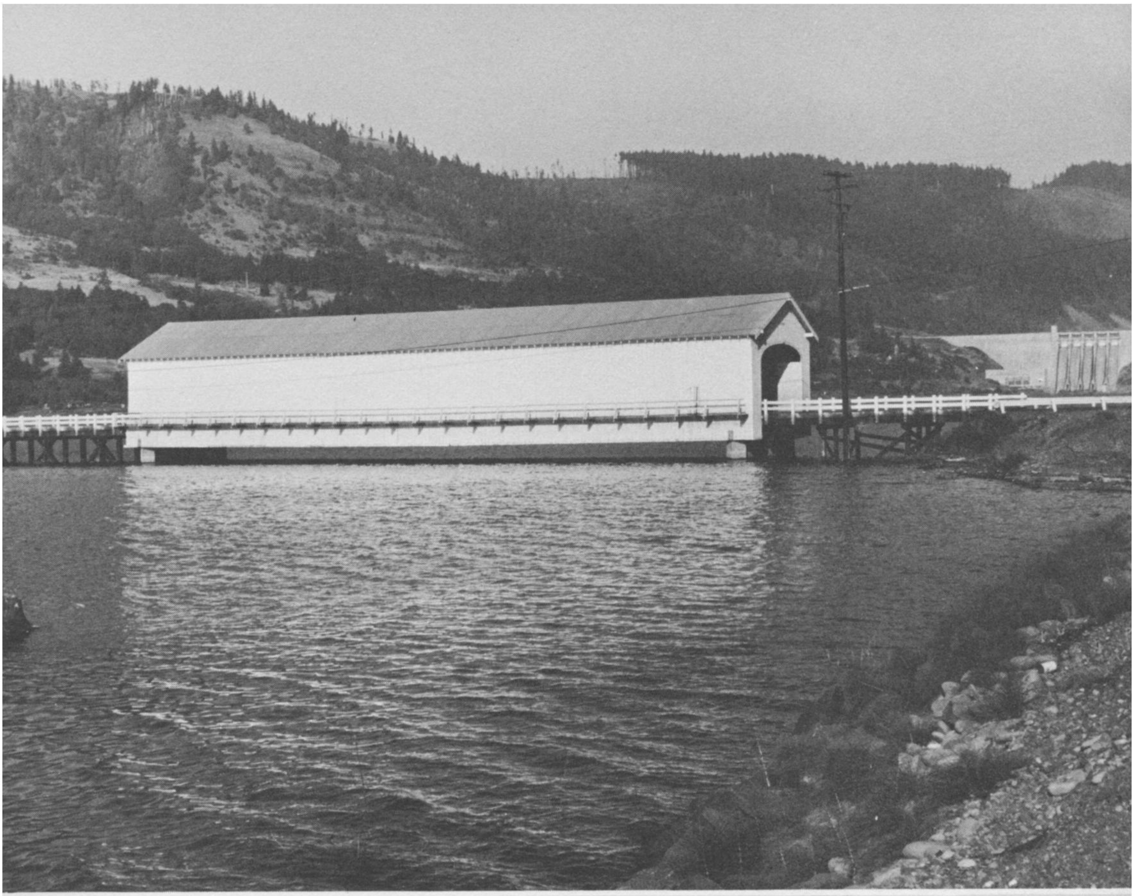
Photo: *By author*

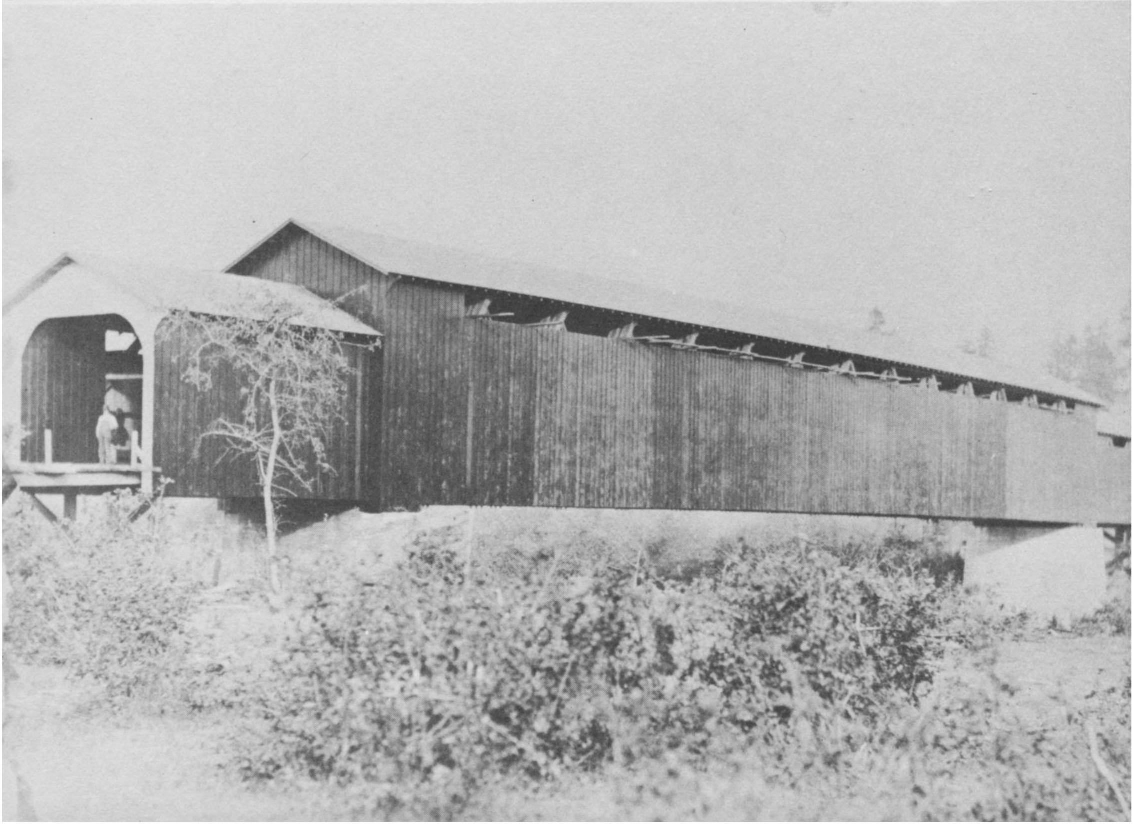
COAST FORK BRIDGE
COAST FORK WILLAMETTE RIVER
LANE COUNTY, 2 MILES WEST OF PLEASANT HILL

T18S-R2W-S30
BUILT: 1915 BY: PORTLAND BRIDGE COMPANY FOR
LANE COUNTY
MAIN SPAN: 3 SPANS: 200′, 56′6″, 30′ HOWE TRUSSES

This structure with the strange covered appendages at each end, was the third bridge to be built on the site, the first by A. S. Miller in 1877. Miller's design, called a "circle truss," was a combination arch and truss claimed to be invented by Miller and Sons, but the design was probably similar to the Burr Arch, seldom used in Oregon. The two spans (160′ and seventy foot) cost $5,000, but both were washed out in the February, 1890 flood. Its replacement was the remarkable 246 foot single span Pratt combination iron and wood truss favored by Hoffman and Bates, Portland bridge builders, and built by that firm for $9,940. It was long of span but short of life, and the three-in-one bridge pictured above replaced it in 1915, at a cost of $9,485.24. It fared better than its predecessors and was not replaced until about 1943 during a road realignment. Ironically, its intended steel replacement span was diverted into wartime service before it ever materialized, so that a 180 foot open timber Howe truss did duty until about 1950, when the present steel structure was installed, the fifth bridge to cross the Coast Fork in this vicinity since 1877.

Photo: *Courtesy Lane County Surveyor's Office*





OFFICE BRIDGE
NORTH FORK MIDDLE FORK WILLAMETTE RIVER
LANE COUNTY, AT WESTFIR
T-21S-R3E-S7
BUILT: 1944 BY: EDWARD HINES LUMBER CO.
MAIN SPAN: 180 FOOT MODIFIED HOWE TRUSS

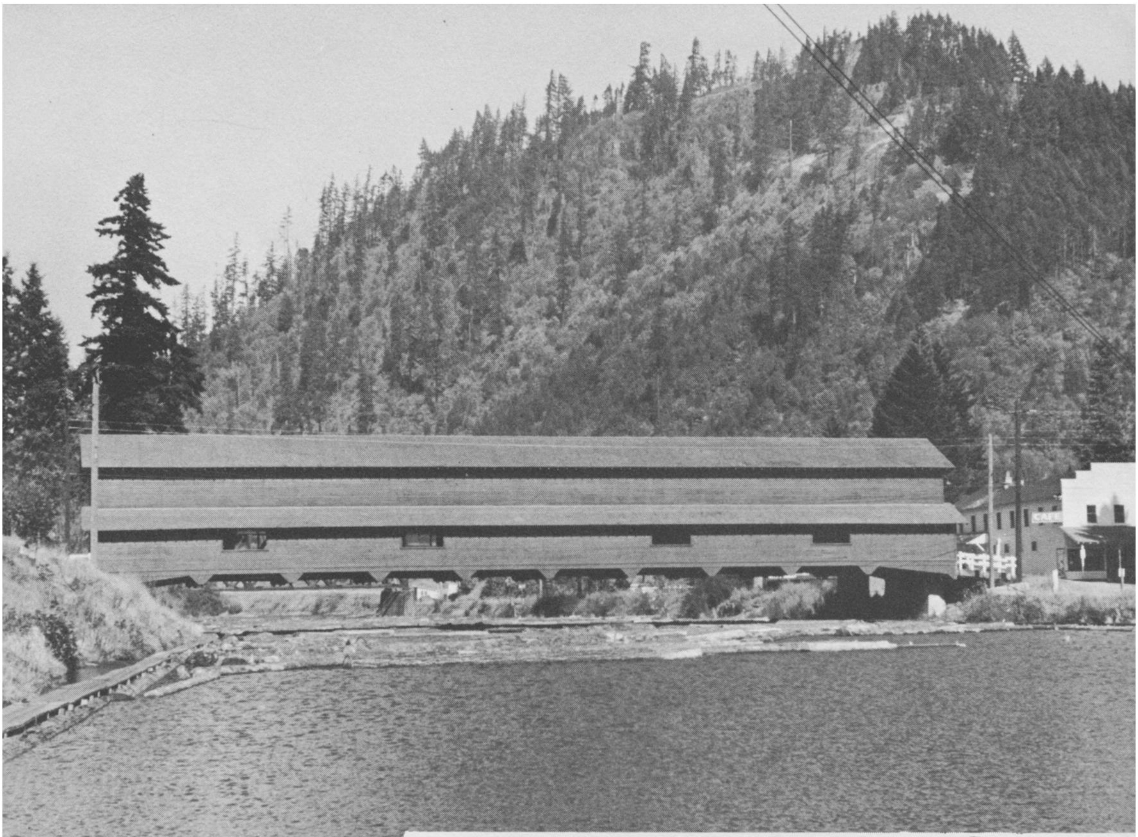
This enormous bridge has one advantage over most Oregon covered bridges. It was specifically designed to accommodate the highest and heaviest logging trucks. The photo is deceptive for the structure is equivalent to a 2½ story building in height. This dark green structure, together with its pedestrian walkway presents an imposing appearance as it crosses the Willamette which has been backed up to form a log pond. Located at an elevation of over 1,300 feet above sea level, the bridge enjoys a backdrop of evergreen studded mountainous terrain. The bridge, which sits astride the company log pond, is situated between the sawmill and the administrative offices, hence the name.

Photo: *By author*

LAURELHURST BRIDGE
ROGUE RIVER
JACKSON COUNTY, 8 MILES SOUTHWEST OF PROSPECT
T33S-R2E-S16
MAIN SPAN: 120 FOOT 7 PANEL HOWE TRUSS

Architectural deficiencies aside, this bridge is located in one of the most scenic and least visited traverses of the famous Rogue River canyon. It is so well concealed from the Crater Lake Highway that it is virtually unknown to covered bridge collectors. Though dwarfed by the canyon sides, the bridge is nonetheless a tall structure, even by log truck standards. County records do not list its erection date, but it is apparently contemporary with similar Jackson County spans of World War I vintage.

Photo: *By author*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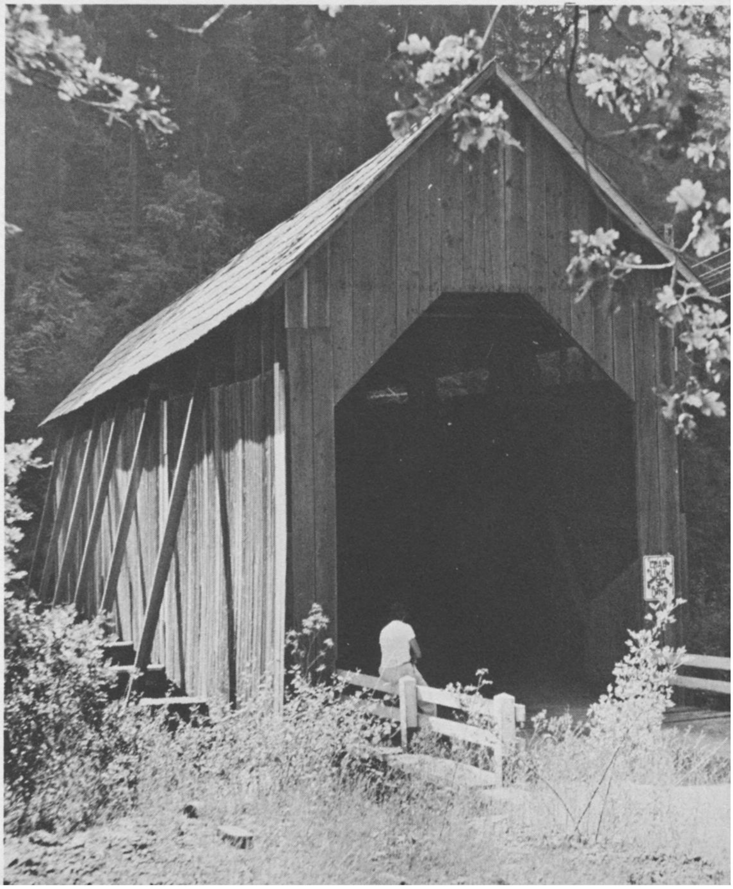


ORTON BRIDGE
SILETZ RIVER
LINCOLN COUNTY, AT LOGSDEN
T9S-R9W-S33
BUILT: 1923 BY: LINCOLN COUNTY
MAIN SPAN: 190 FOOT 14 PANEL HOWE TRUSS

Located about seven miles east of Siletz at the western end of the Nashville-Logsden road, this bridge primarily served the people in and around Logsden. This bridge is a good example of the design characteristics adopted by the Oregon State Highway Commission in the 1920s. That agency furnished free bridge designs to the counties for specific sites, and did much to raise construction standards and to take the engineering thereof out of the hands of unscrupulous bridge contractors. There were several bridges of similar design and spans located near Siletz which were built in the mid 1920s.

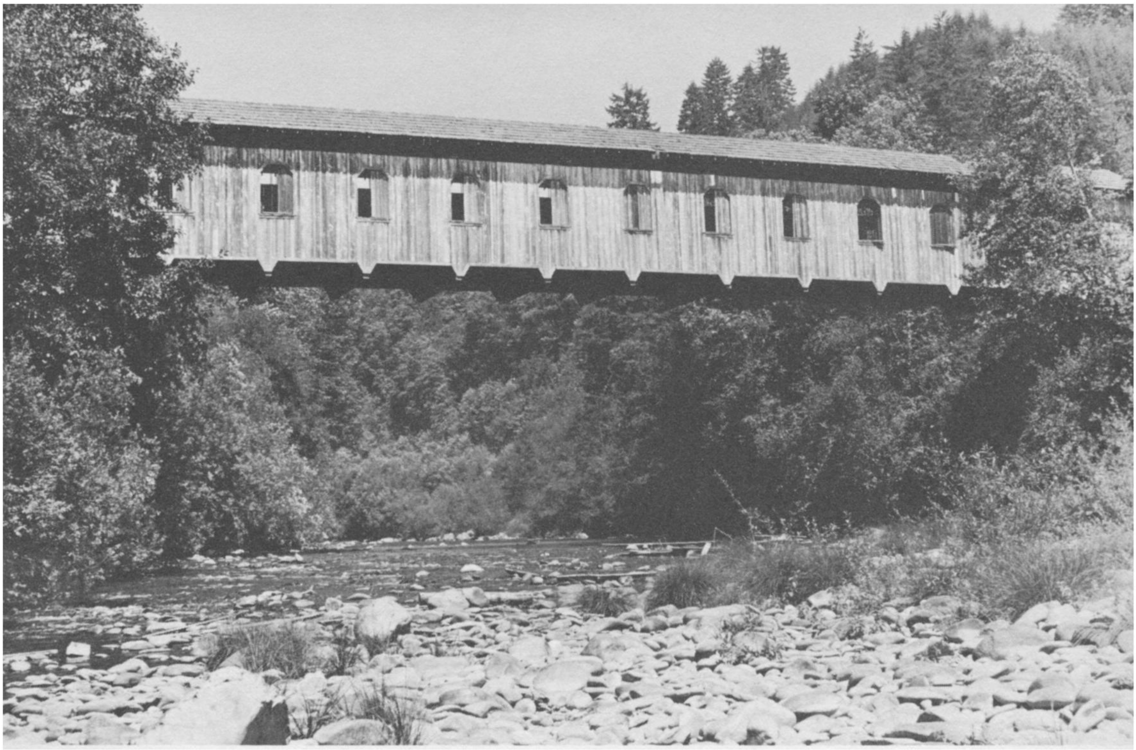
The proximity of many Lincoln County bridges to the ocean gives them a weatherbeaten look consistent with the natural environment and in sharp contrast to many of the Willamette Valley bridges. Orton Bridge is now being dismantled.

Photo: *By author*

YOKUM BRIDGE
COW CREEK
DOUGLAS COUNTY, 2 MILES SOUTHEAST OF RIDDLE
T30S-R5W-S19
BUILT: 1922 BY: DOUGLAS COUNTY
MAIN SPAN: 105 FOOT HOWE TRUSS, LESSER SPAN 75 FOOT HOWE TRUSS

Plans for this standard 105′ Howe truss were drawn for the county by the Oregon State Highway Commission, and that span, including 257 feet of approaches, briefly served the Riddle-Canyonville road until a 1927 flood took out the south-end approach. The approach was replaced with a seventy-five foot Howe truss designed by Floyd C. Frear, Douglas County engineer, this creating a double span to prevent future approach washouts. A contract for housing and roofing the 1927 addition was let in June of that year to Ben W. Taylor, but a partial dismantling in recent times has left the bridge with little protection from the elements. Due to relocation of the road, the span has been replaced with a modern concrete bridge located just upstream from the old structure. Cow Creek has been spanned by many covered bridges, and its course was considered the only practical route for the extension of the Oregon and California Railroad from Roseburg to Ashland. It was for this difficult stretch of line that A. S. Miller and Sons built many wooden bridges and trestles in the mid-1880s.

Photo: *By author*



GILKEY BRIDGE AND SOUTHERN PACIFIC COMPANY BRIDGE NO. 700.99

THOMAS CREEK
LINN COUNTY, 3 MILES SOUTHWEST OF SCIO
T10S-R2W-S23
BUILT: GILKEY BRIDGE, 1939, BY LINN COUNTY; NO. 700.99, 1920, BY SOUTHERN PACIFIC FORCES
MAIN SPAN: GILKEY, 120 FOOT HOWE TRUSS; NO. 700.99, 125 FOOT HOWE TRUSS

The prospect of two adjacent covered bridges—one for trains and the other for automobiles—is a modern rarity, especially in Oregon where several such combinations have recently suffered the removal of either one or the other. Usually the highway bridge is the first to go. This pair is one of the last remaining sets in the state, and the excellent condition of each promises to provide covered bridge enthusiasts an interesting contrast of modern anachronisms for years to come. Located on Thomas Creek, this tributary of the South Santiam passes under a number of Linn County covered spans and joins that river just above the juncture of the South and North Santiam. These two bridges are conspicuous landmarks on the flats below Hungry Hill, only two miles from the Scio-Jefferson road.

The railroad span carries the identification number 700.99, and it crosses Thomas Creek as part of the Woodburn-Springfield Branch Line of the Southern Pacific. It stood unhoused for three years, before the roof and weatherboarding were added to preserve the Coopers E-30 loading capacity. Built in pre-diesel days, it carries the tell-tale accoutrements, ladders and barrels of water. Some of the earliest covered rail spans in Oregon were housed but not roofed in an attempt to eliminate the fire hazard, but the practice did not prove satisfactory as the all important floor beams and top braces were left exposed to the weather.

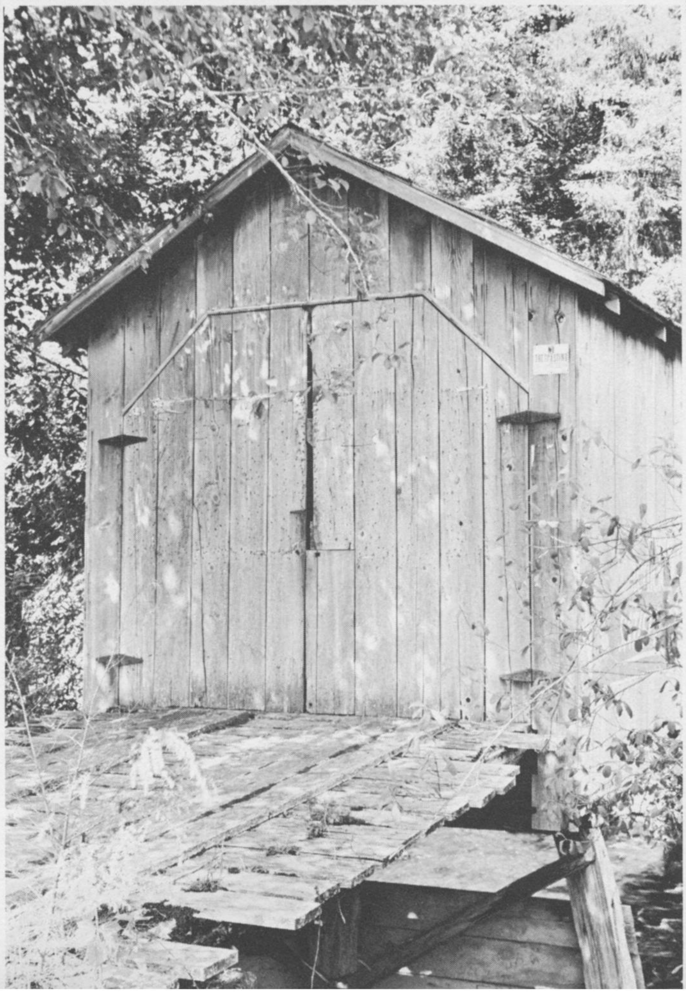
Photo: *By author*

FRANK CROSS PRIVATE BRIDGE

THREE RIVERS
TILLAMOOK COUNTY, ½ MILE SOUTHEAST OF HEBO
T4S-R10W-S13
BUILT: CA. 1915 BY: FRANK AND E. H. CROSS
MAIN SPAN: CA. 60 FOOT QUEENPOST TRUSS

Built primarily to have access to pasture land across the river, the bridge now serves as a semi-barn for cattle. The chords were hewn from nearby second growth fir with the weatherboarding and roof materials split out from cedar. Though built adjacent to a coastal highway, few tourists would suspect that the doors conceal its present function—a covered trussed refuge for cows.

Photo: *By author*



BATES PARK BRIDGE
SOUTH SANTIAM RIVER
LINN COUNTY, 5 MILES NORTH OF SWEET HOME
T13S-R1W-S11
BUILT: CA. 1923 AND 1930
MAIN SPAN: 139 FOOT HOWE AND 153 FOOT HOWE

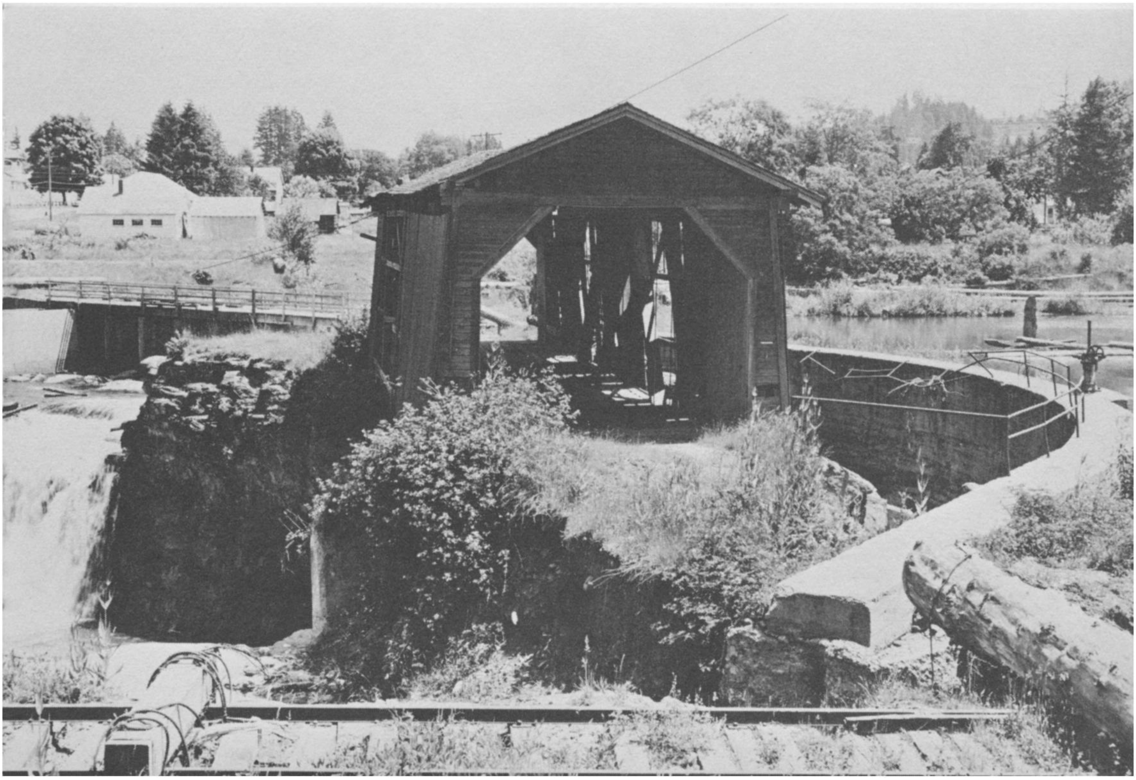
This strange looking structure, which appears to have a broken back, is really two separate bridges. The near span is the older, built ca. 1923, and follows the old Linn County style. It rests on tall, steel caissons. The far span, built 1930, was designed by the State Highway Commission for Linn County, and exhibits a different portal, windows, and a concrete foundation. Except for the color scheme, the differences would not be so evident. The older span is painted barn red, while the newer span is white. This road leads from the Lebanon-Sweet Home Highway to the McDowell Creek road.

Photo: *By author*

WILEY CREEK BRIDGE OR OLD FOSTER BRIDGE
WILEY CREEK
LINN COUNTY, AT FOSTER
T13S-R1E-S27
BUILT: CA. 1917 BY: LINN COUNTY
MAIN SPAN: 83 FOOT HOWE VARIANT TRUSS

While there is nothing remarkable about this bridge, a standard Linn County type for its time, it was encroached upon by various now defunct works of "progress," so that the structure, before its final demolition was a focal point in a dramatic object lesson of obsolescence. The bridge spanned Wiley Creek a short stroll from the old post office, but the business center of Foster has since moved upstream and is now served by a steel deck span built in 1928. To further isolate the old bridge, a double spur track was built along the western bank of Wiley Creek, and formerly accommodated logging trains of the Oregon Electric line, but the tracks had the effect of cutting off the western approach to the bridge. A concrete arch dam was virtually wrapped around the aging structure in an attempt to develop Wiley Creek as a log storage pond. The railroad tracks are now abandoned and blocked against use. The dam is in a disreputable condition due to flood damage and the undercutting of erosion. The approaches to the bridge have been destroyed, and the most recent act of progress to completely isolate the old structure was the erection of a long concrete switch-back fish ladder to overcome the obsolete but formidable obstacle created by the dam. Probably no covered bridge in the country ever enjoyed the anachronistic setting of a dam, a spur line, a log pond, a waterfall and a fish ladder!

Photo: *By author*



Gallon House Bridge

Abiqua Creek
Marion County, 2 Miles North of Silverton
T6S-R1W-S22
Built: 1917 By: Marion County
Main Span: 84 Foot Howe Truss

One of the few remaining covered bridges in Marion County, and structurally undistinguished compared to earlier spans in that county, the Gallon House Bridge was so-named during that era called Prohibition, for a nearby house that dispensed bootleg spirits by the gallon.

Photo: *By author*

River Loop Bridge

Slough
Lane County, 5 Miles North of Eugene
T16S-R4W-S36
Built: 1932 By: Lane County
Main Span: 45 Foot 3 Panel Howe Truss

A typical Lane County span, this bridge displays the same portal design used on earlier Lane County spans by "Nels" Roney. Roney's portal design never varied, and the attempt to classicize the portal with crude pilasters and capitals, all with boards and battens was the Roney "trademark" handed down to his successors, A. C. Striker and Miller Sorensen. Striker was county bridge superintendent when the River Loop Bridge was built. Structurally, it is also typical of the conservatively designed Howe trusses favored by Lane County bridge builders for so many years. The chords are hewn, unspliced; the lower sticks measuring 12″ x 12″ x 51′. Though this is a short span, one-piece hewn lower chords of 100 feet or more are not uncommon in Lane County. An Oregon covered bridge snow scene is not so common as to preclude an entry here.

Photo: *By author*

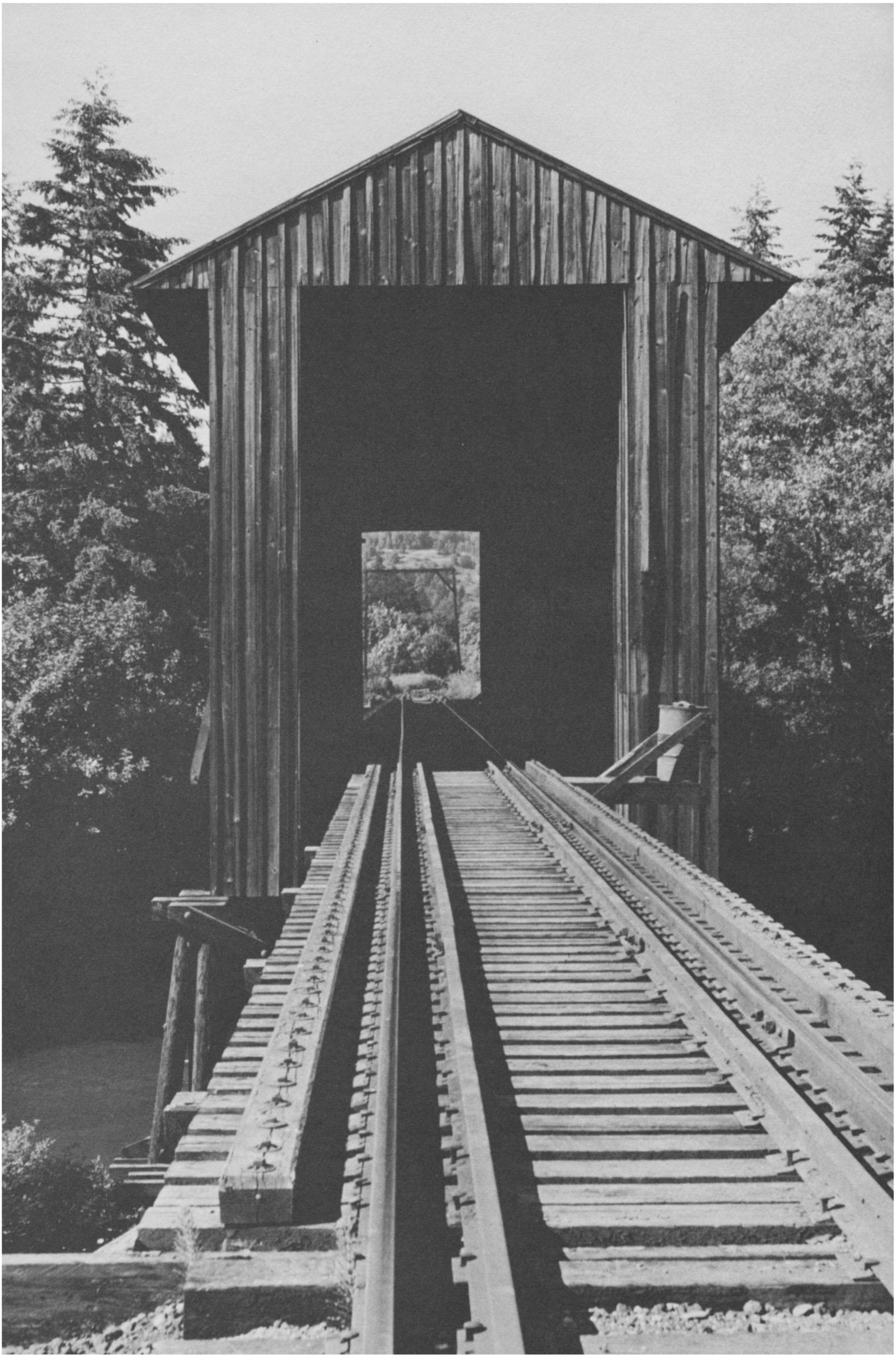
LOAD LIMIT
15 TON

SOUTHERN PACIFIC RAILROAD BRIDGE NO. 651.02
MOHAWK RIVER
LANE COUNTY, 4 MILES NORTHEAST OF SPRINGFIELD
T17S-R2W-S17
BUILT: 1911 BY: SOUTHERN PACIFIC COMPANY FORCES
(HOUSED 1915)
MAIN SPAN: 150 FOOT THROUGH HOWE TRUSS. COOPERS
E-30 LOADING

Oregon's covered railroad bridges are generally of very straightforward design. Architectural refinements are subordinated to strict functional considerations. In this case, the verticality of the plain portal is emphasized by the battens, giving the tall structure an even more stilted look. No provision was made for smoke escape.

This bridge was built on the Marcola branch line to accommodate heavy logging from the Booth-Kelly Lumber Co. reserves near Marcola and Wendling, but the line is now little used as much of the land has been logged off. Just upstream and within sight of this bridge, was the covered Yarnall Bridge, a county structure which was removed in 1957. Also on this line are several old pre-fabricated, pin-connected, iron bridges with touches of Victorian ornament, from the famous Phoenixville Bridge Works in Pennsylvania, moved from other sites and reused on this line.

Photo: *By author*



VALLEY AND SILETZ RAILROAD BRIDGE
LUCKIAMUTE RIVER
BENTON COUNTY, 2 MILES NORTH OF HOSKINS NEAR SITE OF FORT HOSKINS
T10S-R6W-S18
BUILT: 1946 BY: VALLEY AND SILETZ RAILROAD
MAIN SPAN: 80 FOOT SKEW SPAN HOWE PONY TRUSS, COOPERS E-35 LOADING (HOUSED, 1947)

Fort Hoskins, established 1856 near the present community of Hoskins, is chiefly known as the terminus of a trail (laid out by the then Lieut. Philip H. Sheridan) which crossed the Coast Range into the Siletz Indian country. Descending from the Coast Range, the Luckiamute River empties into the Willamette between Albany and Independence. A covered bridge crossing the Luckiamute at Kings Valley is one of the few such spans remaining in the state numbered highway system.

The housed but unroofed rail span shown above is a unique example of bridge building science, which combines the economy of protected timber bridges without the spark-arresting roof. Built for private use of the Valley and Siletz Railroad, there are three similar spans on this logging line, which follows the Luckiamute into the heart of the Coast Range and eventually terminates at Valsetz.

The adjacent county bridge was built about 1932 with a five-panel, 75 foot Howe truss, but was removed in the fall of 1956, shortly after the above view was recorded.

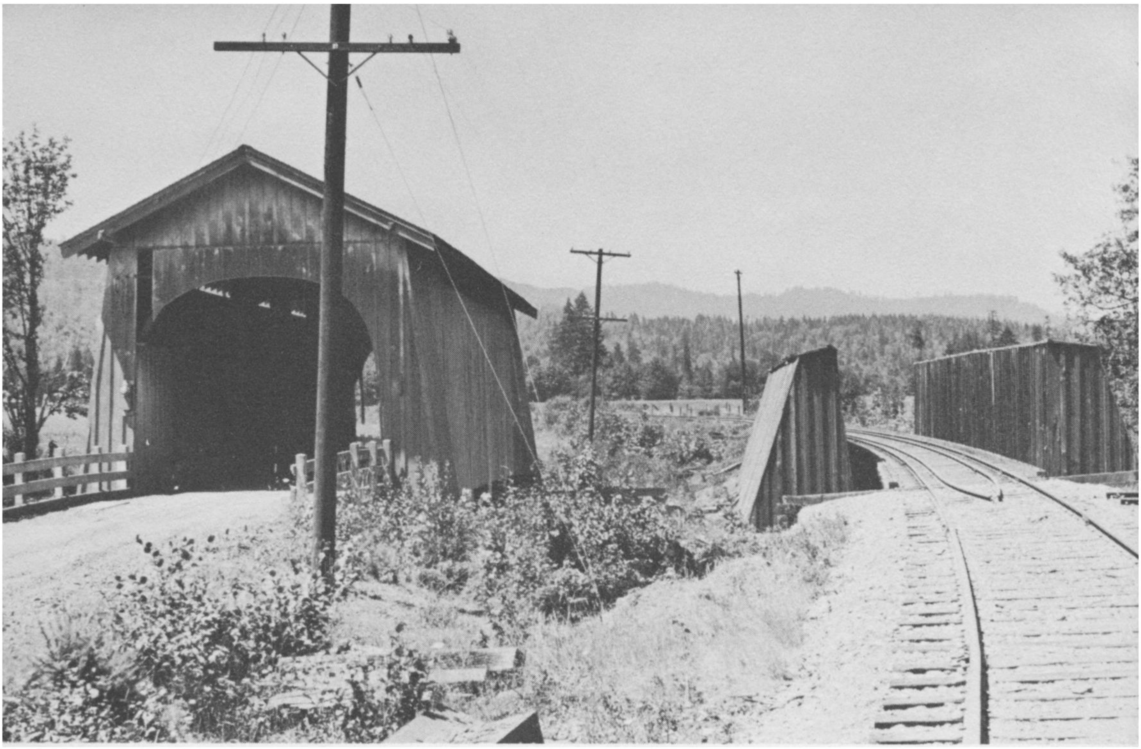
Photo: *By author*

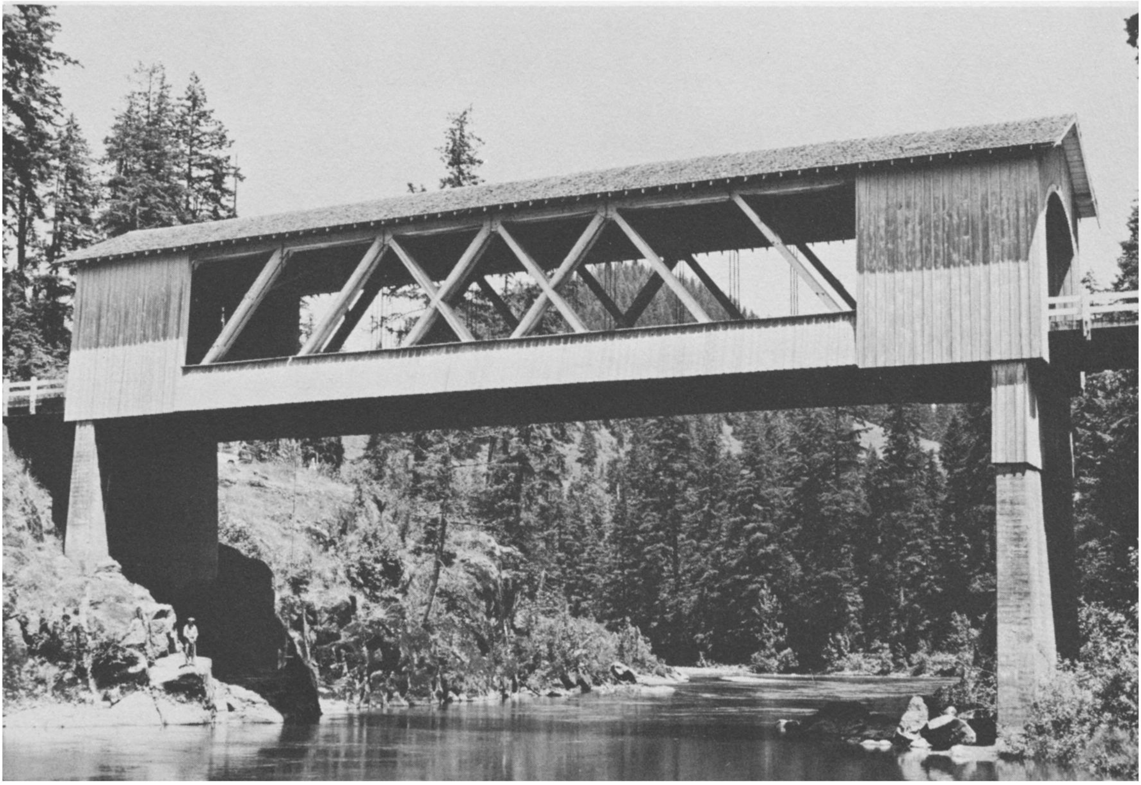
HUFFORD BRIDGE
MIDDLE SANTIAM RIVER
LINN COUNTY, 3 MILES EAST OF FOSTER
T13S-R2E-S19
BUILT: 1938 BY: LINN COUNTY
MAIN SPAN: 120 FOOT 8 PANEL HOWE TRUSS

Probably the most remarkable quality of Linn County covered bridges is their variety of design. While most county bridges are rather fixed in one mode of architectural expression, Linn County has several such "modes." The vigorous bridge above serves the Hufford road from the Quartzville road.

Structural articulation is visually assured by a clearly defined rectangular opening in the sides of the bridge. The roof continues to protect the upper joints, the lower joints are boxed in, so that the function of the covering is not lost. Besides furnishing additional illumination to the interior, the openings furnish the aesthetic mechanism for lifting the bridge from a floating box to a clearly articulated structural expression of function.

Photo: *By author*





KIGER ISLAND BRIDGE
BOONEVILLE CHANNEL WILLAMETTE RIVER
BENTON COUNTY, 3 MILES SOUTH OF CORVALLIS
T12S-R5W-S14
BUILT: 1938 BY: BENTON COUNTY, COST UNDER $10,000
MAIN SPAN: TWO 170 FOOT 10 PANEL HOWE TRUSSES

Kiger Island, once isolated between the main channel and Booneville channel of the Willamette, and the bridge which conveys traffic to Benton County points, carry the name of Reuben C. Kiger, a pioneer resident of the county. Though the area is as rural as it was in Kiger's time, the modern bridge structurally is several generations removed from the pioneer system of empirical building. Characteristic of that quality which differentiates Oregon covered bridges from their eastern forespans, Kiger Island bridge presents a crisp, articulated appearance. Unfortunately, or fortunately, depending upon the point of view, it is nigh impossible to attach any aura of romanticism to such a coldly efficient structure. Actually, it demonstrates the carryover of the practical covering tradition into the vernacular of modern bridge building. Visually, the center pier seems to be an unnecessary obstacle to this air-borne tunnel of wood. In reality, of course, it is an integral but weak part of the system, for against its upriver side lodge the drift and debris which threaten the entire bridge in time of flood and freshet.

Visual relief is provided by the continuous strip windows which not only reveal the inner structure but light the roadway as well.

All of which purports to say that as with most Oregon covered bridges, the most interesting aspect is not the frontal view but its broadside. Few Benton County covered bridges possess the straightforward simplicity of design and expression of function built into the Kiger Island bridge.

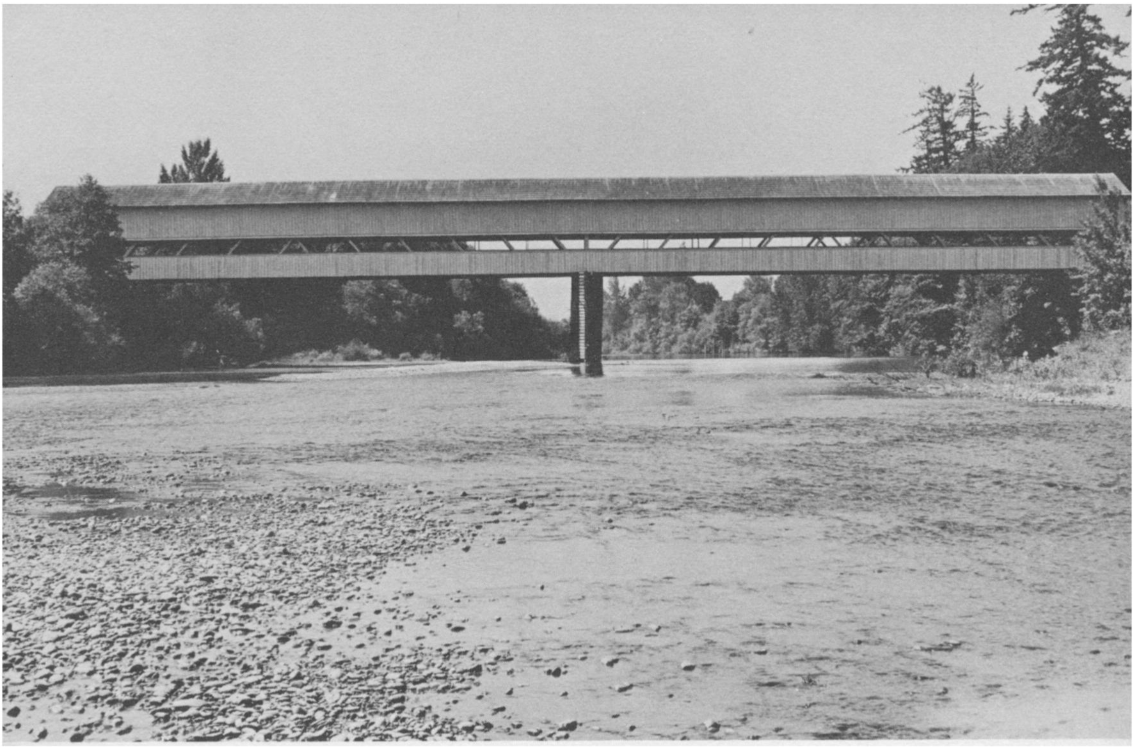
Photo: *By author*

TROUT CREEK BRIDGE
MOLALLA RIVER
CLACKAMAS COUNTY, 6 MILES SOUTHEAST OF MOLALLA
T6S-R3E-S6
BUILT: 1928 BY: CLACKAMAS COUNTY
MAIN SPAN: 60 FOOT HOWE TRUSS

The Trout Creek Bridge is one of those otherwise uninteresting spans animated by the ruggedness and denseness of the local terrain and plant life. On the other hand, the bridge, apparently suspended, enhances a pleasant and popular picnic area along the upper reaches of the Molalla, just below the Trout Creek outlet. Abandoned and structurally unsafe, this last remaining covered span in the county was razed in July, 1957, to make way for a timber access road.

Its short life, just under thirty years, reflects the basic difference between Oregon covered bridges and those of the Northeast: obsolescence is greatly hastened in a region where patterns of land use and economics are constantly shifting.

Photo: *By author*



RITNER CREEK BRIDGE
RITNER CREEK
POLK COUNTY, 1 ½ MILES NORTH OF KINGS VALLEY
T10S-R6W-S5
BUILT: 1926-27 BY: HAMER AND CURRY, CONTRACTORS,
FOR POLK COUNTY
MAIN SPAN: 75 FOOT HOWE TRUSS, COST $6,963.78

This bridge is a fine example of the Oregon State Highway Commission standardized design during the late 1920s. It illustrates the attention to portal details, the functional whitewashed interior and tall window openings. It is located on the Dallas-Wren Secondary State Highway one-half mile north of the Polk-Benton county line. In 1927, this route was known as the Kings Valley Market Road, and today is one of the most pleasant drives in western Oregon. There are a half-dozen covered bridges within a few miles of this structure, including a sister-span at nearby Kings Valley.

Photo: *By author*

IMPAIRED CLEARANCE
HEIGHT 12 FEET
RITNER CREEK
OREGON
223

BRYANT PARK BRIDGE
CALAPOOYA RIVER
LINN COUNTY, AT ALBANY
T11S-R4W-S12
BUILT: CA. 1924 BY: LINN COUNTY
MAIN SPAN: 130 FOOT HOWE TRUSS

The Calapooya, which descends from the Willamette National Forest just north of the Lane county line, flows past Crawfordsville and Brownsville, and finally drains into the Willamette River at Albany. While several covered bridges still span the Calapooya, none is so interesting as the Bryant Park Bridge which crosses that stream barely 500 yards from its confluence with the Willamette. Covered spans with pedestrian walks are not uncommon in the East, but few have ever been built in the Far West. In this case, the open-sided pedestrian way accommodated foot traffic to Bryant Park. The Oregon Electric Railroad line passes by the west end of the bridge, and the Albany Ditch drops into the Calapooya near the east portal. The "Ditch," with several covered spans of its own, traverses fourteen miles from the South Santiam at Lebanon to Albany with a total drop in elevation of only 150 feet. This now uncovered bridge marks a point of convergence for these tenuous man-made and natural lines on the topographical map: the Calapooya River, the Oregon Electric, the Albany Ditch and the Willamette River.

Photo: *By author*

UNIDENTIFIED HOFFMAN AND BATES BRIDGE

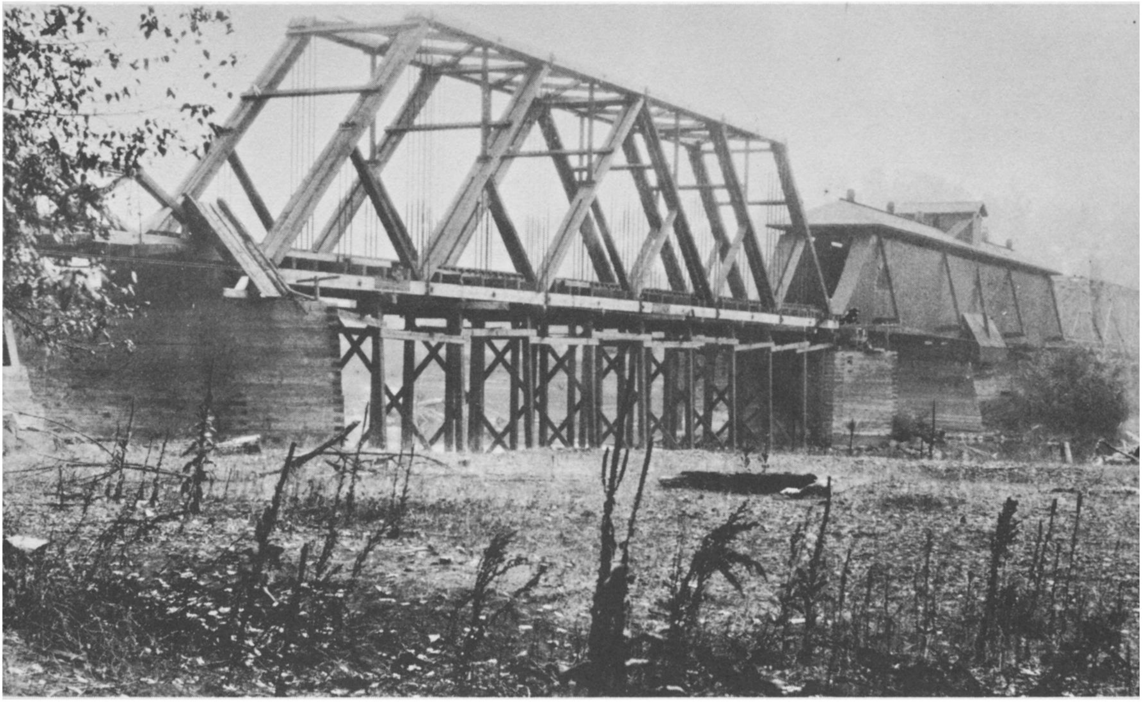
The covered railroad bridge depicted here, although not identified, is one of the many spans built by the enterprising firm of Hoffman and Bates during the late 1880s and 90s. Lee Hoffman came to Oregon via California and his first known work here was to assist A. S. Miller in the building of the 1874 Springfield bridge. He returned to San Francisco where he continued his career with the Pacific Bridge Company. When that firm established a Portland office in 1880, Hoffman re-established himself in Oregon and commenced the supervision of several Willamette Valley bridge contracts. George W. Bates was also connected with the Pacific Bridge Company in a similar capacity.

The two men combined forces in 1885, and promptly captured a fair share of the bridge business, securing contracts on a state-wide basis, which included railroad bridges, county bridges and trestlework. Although they occasionally built covered spans, such as the interesting hip-roofed example shown under construction, they usually favored the Pratt combination iron-and-wood truss. Sometimes they simply wrapped the wood truss members with sheet iron so as to protect the wood and critical joints from direct exposure to the elements. While such bridges do not visually qualify as covered bridges, they are technically in that class nevertheless.

Following the 1890 flood, public sentiment turned away from wooden bridges in favor of the more permanent steel structures. From that time on, Hoffman and Bates, like many other Oregon bridge builders, reorganized their business around the erection of prefabricated pin-connected steel bridges.

Photo: *Courtesy L. H. Hoffman, Portland*

BRYANT PARK
NO CAMPING
LOAD LIMIT 3 TON GROSS WEIGHT
STOP



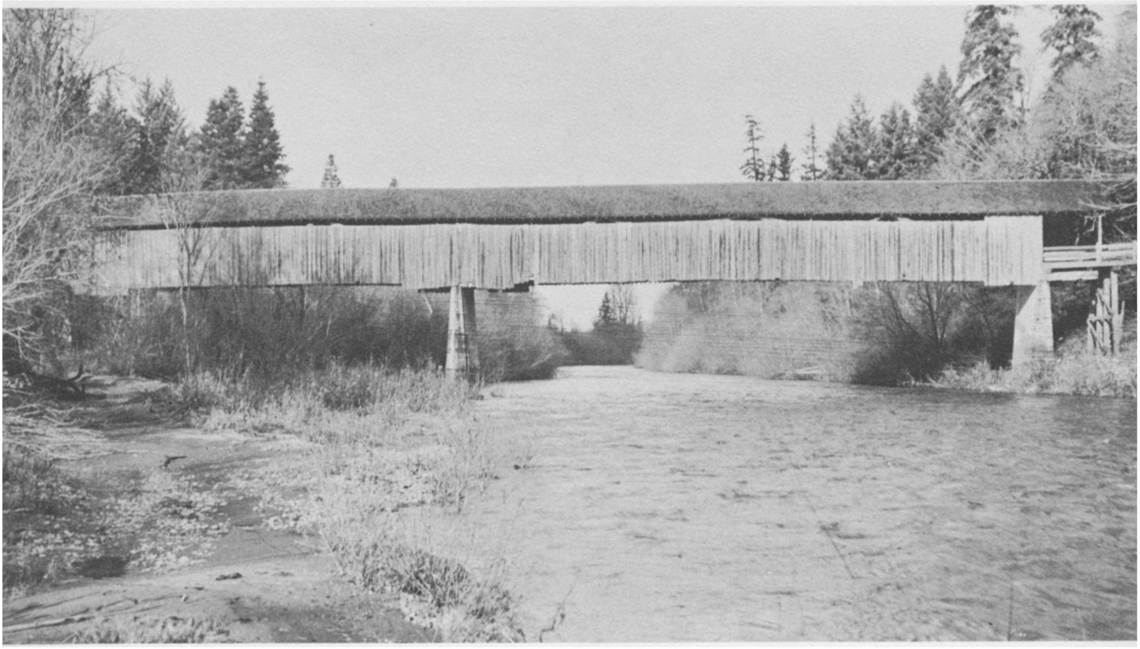
KNIGHT'S BRIDGE
MOLALLA RIVER
CLACKAMAS COUNTY, ONE MILE WEST OF CANBY
T3S-R1E-S32
BUILT: 1877 BY: A. S. MILLER & SONS
MAIN SPAN: 87 FOOT HOWE AND 123 FOOT STRAIGHT "ARCH-BRACE" TRUSS

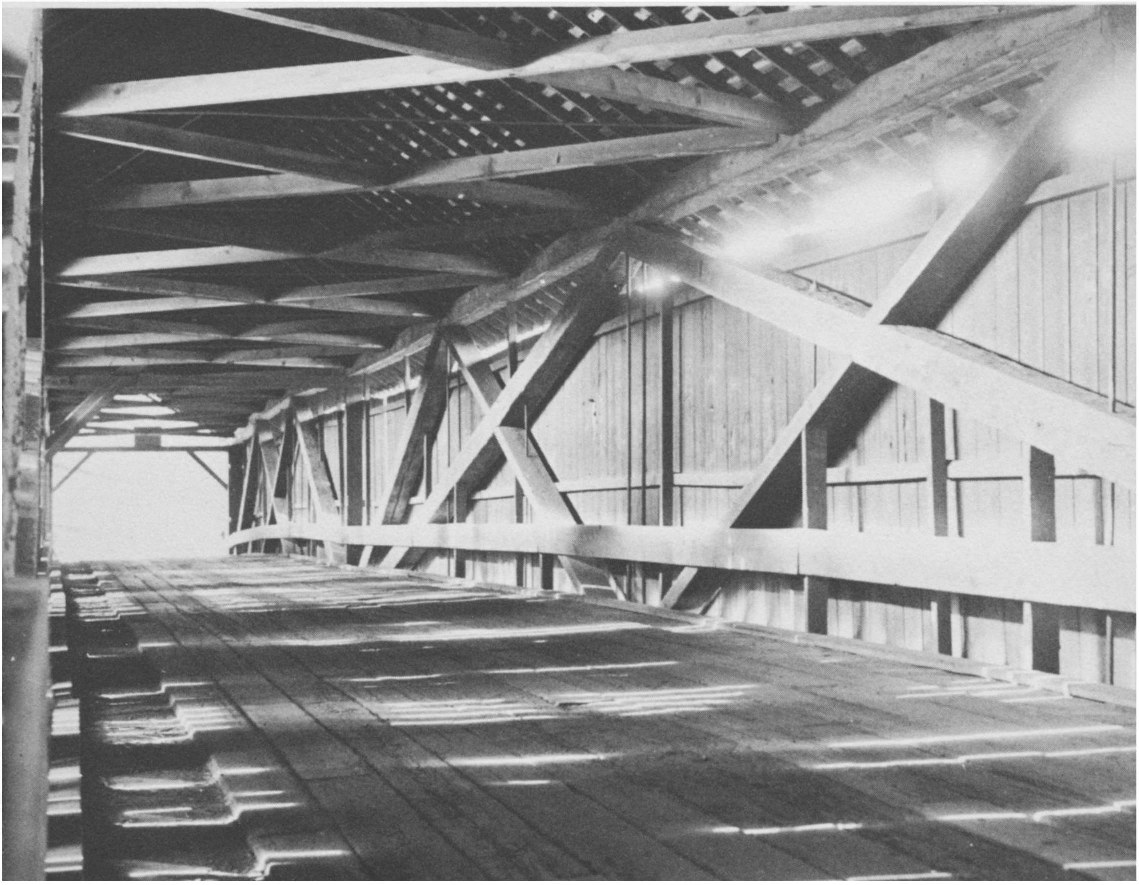
The old Knight's Bridge was certainly one of Oregon's best-known covered bridges. Its very longevity earned it a special place in the hearts of those nostalgically inclined to admire the pioneer concept of quality.

Although frequently dated 1876, the contract was not let until March of 1877. A. S. Miller and Sons finished this, their most long-lived covered bridge, in November of that year. It was also one of the few bridges built by that firm which did not follow their usual Smith patent truss design. Plans in this case were by A. J. Cason, the local bridge superintendent.

In addition to Cason's strange truss, the bridge was immediately subject to protests from farmers complaining of the "low girts," which prevented passage of loaded hay wagons. Despite such disadvantages, or perhaps because of them, the bridge resisted every act of nature's destructive forces until 1947, when the old span was blown broadside into the Molalla River by a severe winter gale. Its passing was noted throughout the Willamette Valley for it had become a rural symbol of the settler's conquest over the rawness of the frontier.

Photo: *Courtesy Oregon State Highway Commission*





NORTH FORK BRIDGE
NORTH FORK SMITH RIVER
DOUGLAS COUNTY, 16 MILES EAST OF GARDINER (BY ROAD)
T20S-R10W-S31
BUILT: 1930 BY: DOUGLAS COUNTY
MAIN SPAN: 80 FOOT 5 PANEL HOWE TRUSS

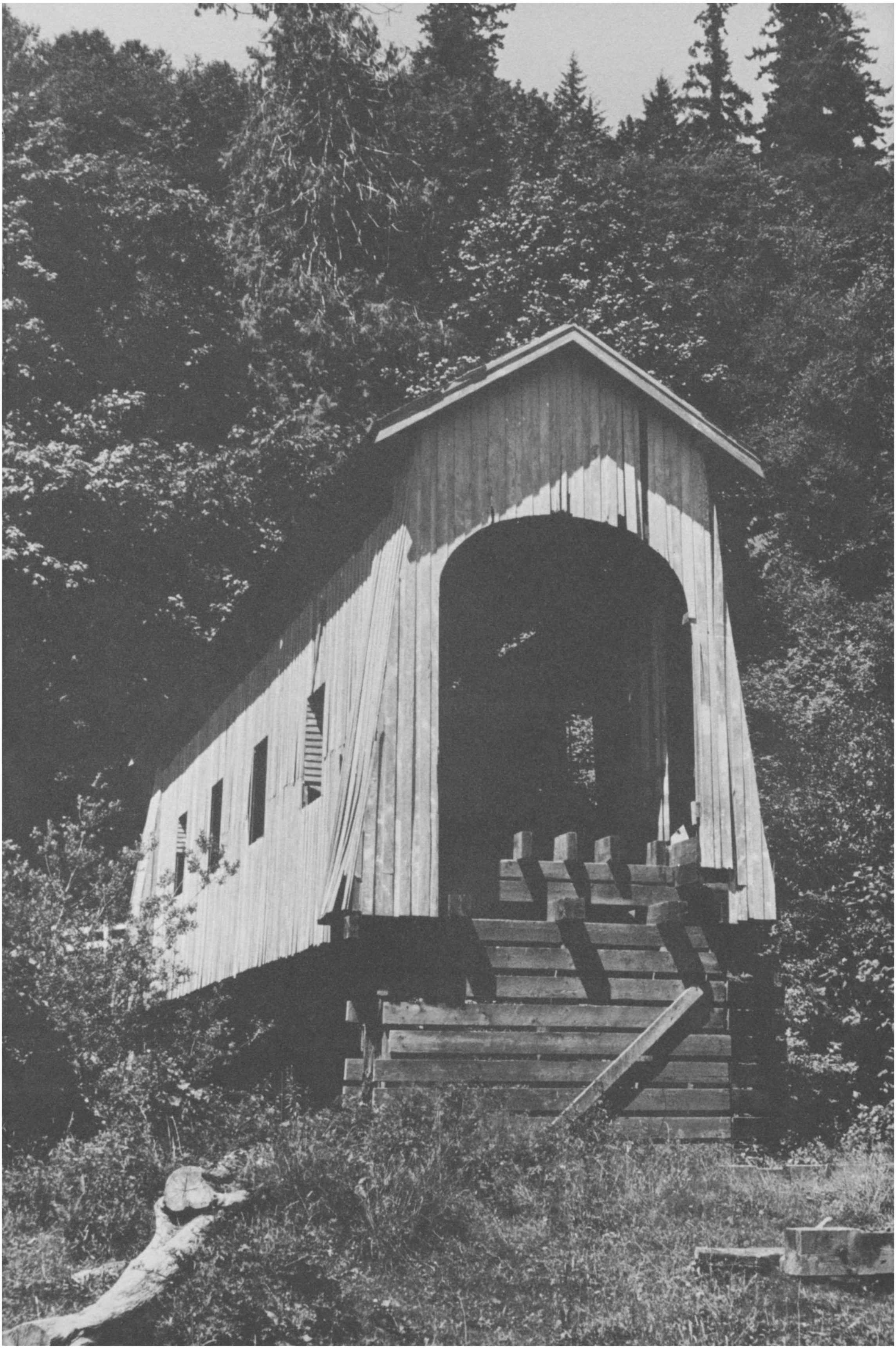
Though remotely situated in the Smith River defile of the Coast Range in Siuslaw National Forest, tidewater conditions required perfunctory approval from the War Department before the river could be bridged at this point. To obtain the proper height above high water line necessitated over 700 feet of approach because of the low lying meadow adjacent to the river at that crossing. Plans for the structure were drawn by F. C. Frear, a long-time bridge engineer for Douglas County.

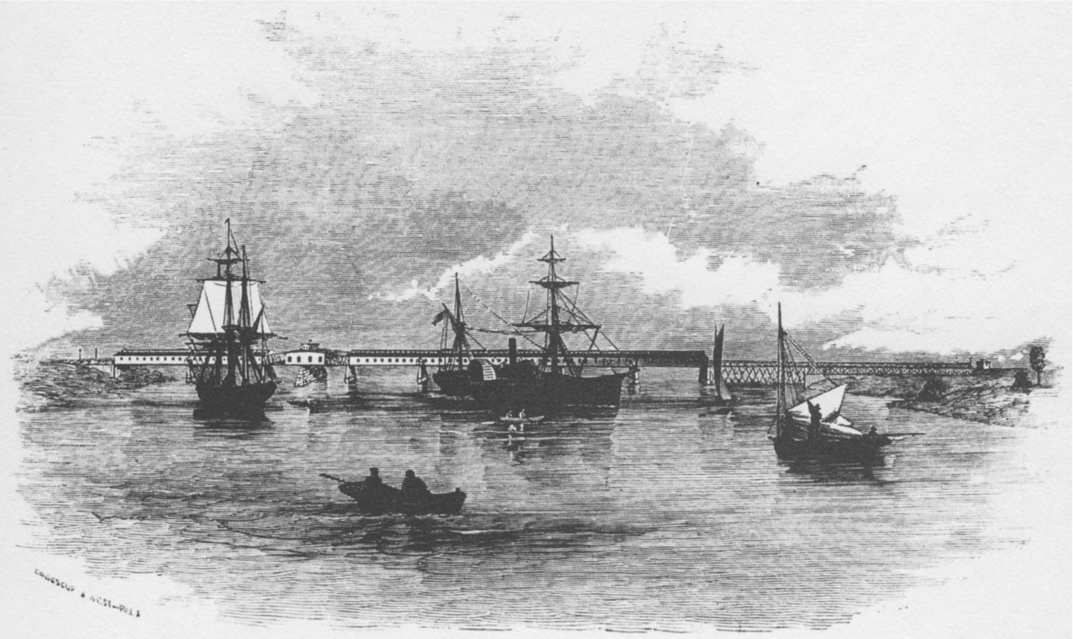
More recently, the bridge was slated for abandonment due to a relocation of the road slightly downstream. The process was hastened however, when in March, 1954, a piece of road equipment rammed into the bridge and crushed a floor beam. Like many of Oregon's covered bridges, the usefulness of this structure was cut short long before its ultimate life span had been reached, most often due to changing patterns of road use.

This bridge enjoys a remarkable coastal environment. To see it requires a trip to Gardiner by the ocean and a drive back into the heart of the Coast Range of mountains in the Siuslaw National Forest. Although the old road at this point is sixteen miles into the mountains from the Pacific, the Smith River is only thirty feet above sea level, but the surrounding hills rise to nearly a thousand feet.

Douglas County's Smith River is named for Jedediah Strong Smith, fur trader and explorer, whose party camped near the confluence of the Smith and Umpqua rivers, barely six miles from the Pacific. His camp site was attacked by Indians on July 14, 1828, but Smith and most of his party escaped. Explorer Smith's wide-ranging travels mark him as a rugged individualist, and at least one other river, in northern California, also carries his name.

Photo: *By author*





"A HIGHLY ORNAMENTAL STRUCTURE"
WILLAMETTE RIVER
MULTNOMAH COUNTY, FOOT OF COLUMBIA ST., PORTLAND
MAIN SPAN: SEVEN 200 FOOT HOWE SPANS WITH A 275 FOOT REVOLVING SPAN

The covered bridge shown above, if finished, would not only have been Portland's first bridge to span the Willamette, but the longest covered bridge ever built in the state. That such a structure could cross the navigable Willamette and connect Portland to East Portland, was made possible by a Congressional Act of 1870. Many proposals were in the offing however, and various interests vied for the city's sanction. After most of the smoke cleared away, Messrs. H. R. Leonard, W. W. Piper, *et al*, were the leading contenders. Leonard, an experienced promoter and railway bridge engineer, fresh from other covered rail span successes in California and Oregon, confidently plied the council with evidences of his structural cleverness. He built a 20 foot model truss of his own design, partly for self assurance but mostly for promotional purposes. To ensure that the structure would be "strictly first class," he collaborated with W. W. Piper, Portland's leading architect. Together with six other Portland businessmen, they incorporated as the Portland Bridge Company, on August 22, 1872. Amid much speculative interest, the plans were presented to the City Council. A $10,000 completion bond was also submitted, calculated to impress hesitant councilmen. Leonard wrote his own copy for publication in the *Oregonian:*

> The superstructure will be covered with tin and weatherboarded on the outside, with open ventilation in the roof the entire length. To afford light by day there will be large windows every 20 feet. By night it will be illuminated with gas. The floor will be covered with Nicholson pavement, and the ends are to be properly enclosed by colonnades and ornamental gables. . . . The footways will be furnished with six saloons—three on each side—for resting places.

Six saloons! With such accoutrements, how could the project fail? Actually, the bridge though unprecedented in local terms, was soundly designed. To amortize the cost more quickly, double rail tracks were to be installed in the floor, to enable the structure to serve the mass transportation media. The saloons were reached by footwalks on each side of the bridge. Including the 275 foot steam powered revolving span and the approaches, the total length would have stretched to 2,637 feet.

Following approval by the council, the Secretary of War signed his approval in January of 1873. With the driving of piles in February, the project was underway, but the 1873 financial panic nipped the work in the pile driving stage. In April, Leonard's franchise was voided and given to Ben Holladay, but nothing materialized. Fourteen years were to pass before Portland could boast a bridge across the Willamette, but it was a very prosaic open truss span, without the benefit of saloons.

Photo: *Leopold Samuel's* Portland Directory, *1873, 325*.